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PATENT ABSTRACTS OF JAPAN

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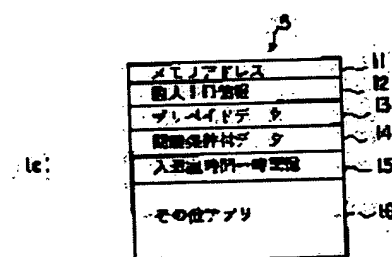
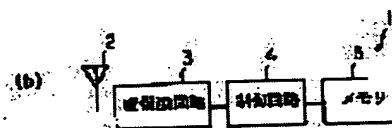
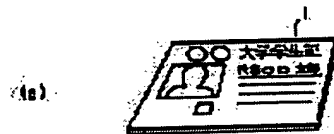
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(54) NONCONTACT INFORMATION STORAGE SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To make office work efficient and speedily obtain necessary information and documents by providing a storage means which stores information, a control means which controls information, and a communication means which communicates information without any physical connection.

SOLUTION: A noncontact information recording medium 1 consists of an antenna 2, a modem circuit 3, a control circuit 4, and a memory 5. A memory map stored in a memory 5 consists of a memory address 11, individual ID information 12, prepayment data 13, time-limited data 14, room entry and exiting time temporary storage 15, and others 16. A noncontact medium 1 is employed as a student's identification card and RWU terminals are arranged in a campus to provide various services such as notification on bulletin boards in the campus and certificate issue. Then a noncontact information recording system which covers the majority of services of the school such as attendance/absence management in respective classrooms and prepaid services at school restaurants can be constituted by connecting the RWU terminals by a network.



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CLAIMS

[Claim(s)]

[Claim 1] The non-contact information record medium characterized by providing a storage means to memorize various information, such as the items mentioned as a student identification card, and accounting information, the control means which control the information memorized by this storage means, and the means of communications which communicates the information controlled by these control means by non-contact.

[Claim 2] The non-contact information recording device characterized by providing the following. The 1st means of communications which communicates information through the host computer and network which have memorized all candidates' information. Control means which control the information which communicates by this 1st means of communications. The 2nd means of communications which communicates the information controlled by these control means by non-contact. A display means to display the information which communicates by this 2nd means of communications, or the information which communicates by the 1st means of communications of the above.

[Claim 3] The non-contact information recording device characterized by to provide the read-out means which reads the reference information currently recorded on the non-contact information record medium by non-contact, the display-output means which carries out the display output of the information corresponding to the reference information which read with this read-out means, and a record means record the information by which the display output was carried out with this display-output means by non-contact on the above-mentioned non-contact information record medium if needed.

[Claim 4] The non-contact information recording device characterized by providing the read-out means which reads the reference information currently recorded on the non-contact information record medium by non-contact, and the printing means which carries out the printout of the documents which need based on the reference information which read with this read-out means.

[Claim 5] The non-contact information recording device characterized by providing a change means to change the information currently recorded on the non-contact information record medium with which various information is recorded by the above-mentioned non-contact information record medium in informational read-out and the non-contact information recording device which performs writing by non-contact by time.

[Claim 6] The non-contact information recording device which writes in by reading to the non-contact information record medium which is characterized by providing the following, and which is recording the term data of borrowing with a time limit, such as a book of a library, by non-contact. The read-out means which reads the term data currently recorded on the above-mentioned non-contact information record medium by non-contact. A comparison means to compare the term data read with this read-out means with the date data built in beforehand, and a display means to display warning according to the result of this comparison means.

[Claim 7] The non-contact information recording device characterized by to provide the read-out means which reads the reference information recorded on the non-contact information record medium which the above-mentioned user holds by non-contact, and a display-output

means is based on the reference information which read with this read-out means, and display or output required information when a user detects with a detection means detection existence of a user, and this detection means.

[Claim 8] The non-contact information recording device characterized by providing a display-output means to display or output information required for the possessor who possesses the above-mentioned non-contact information record medium only while the above-mentioned non-contact information record medium has reacted to the question signal outputted with an output means to output a question signal to a non-contact information record medium according to non-contact by the fixed time interval, and this output means.

[Claim 9] The non-contact information record system characterized by providing the following. The non-contact information record medium with which a user possesses and information is recorded by non-contact. The host computer which grasps the state of the above-mentioned each part store on real time using the close leaving information read with a non-contact information record means to read the close leaving information of the user who possesses the above-mentioned non-contact information record medium by being prepared in the entrance of each part store and performing informational read and writing by the above-mentioned non-contact information record medium and non-contact, and this non-contact information record means.

[Claim 10] The vending machine characterized by to provide a non-contact information record means write in by reading identification information, age information, and prepaid information of the owner currently recorded on the non-contact information record medium which an owner possesses by non-contact, and a limit means restrict the above-mentioned owner's purchase according to the identification information read with this non-contact information record means, age information, and prepaid information.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention consists of a non-contact information record medium and a non-contact information record terminal, and relates to the non-contact information record system which writes information by non-contact.

[0002]

[Description of the Prior Art] A candidate's photograph was stuck on paper or the card of plastics, and the conventional student identification card was only that by which individual ID information is printed. When required, the candidate showed the manager of a school this, and I took the examination, or had the certificate published, or he borrowed the book at a library.

[0003] Moreover, the connection bulletin board in a school (especially university) was collectively put up for the place where connection or cancellation of a lecture, connection or report presentation, connection that performs an examination, the call to an individual, etc. are the same in many cases. On the other hand, as for attendance-and-absence management of a candidate, what used papers, such as an attendance-and-absence vote, was common, and the manager (teacher) had taken time and effort to the correspondence work which tests the submitted attendance-and-absence vote and list of names by comparison.

[0004] In the case of the conventional student identification card, the personnel by the side of a school (janitor) had to look at the student identification card by the direct eye, and the owner had to check whether you were him. Moreover, in order to have checked certainly, since the size of a student identification card was small, this had to be directly checked for the hand. This was troublesome also for the personnel by the side of a school (janitor) also for the candidate. Moreover, it was difficult to database-ize the shown content or the content of a check of a student identification card, the personnel had to input into the terminal anew, and it took time and effort.

[0005] Moreover, the time and effort of the conventional connection bulletin board being packed into one place, and having the notice of a huge amount of information required for itself looking at whether it is really required information, and something checking it was this thing. It was very crowded especially before the bulletin board in front of the duration of test, and acquiring information required for oneself had taken time. Therefore, the connection to an individual, connection or cancellation of a lecture, etc. were overlooked in many cases.

[0006] Moreover, the work of checking and database-izing a candidate's attendance and absence by the attendance-and-absence vote from which managers were collected in attendance-and-absence management is done, and great time was spent.

[0007]

[Problem(s) to be Solved by the Invention] As described above, for a manager (school personnel) side, time and time and effort were taken very much to office work, and there was a problem that the information or documents which are needed also for a user (candidate side) could not be obtained quickly.

[0008] Then, this invention can attain the large increase in efficiency of office work for a manager side, and aims at offering the non-contact information record system which can obtain

the information which he needs quickly also for a user, and documents.

[0009]

[Means for Solving the Problem] The non-contact information record medium of this invention consists of a storage means to memorize various information, such as the items mentioned as a student identification card, and accounting information, control means which control the information memorized by this storage means, and means of communications which communicates the information controlled by these control means by non-contact.

[0010] The 1st means of communications which communicates information through the host computer and network where the non-contact information recording device of this invention has memorized all candidates' information, It consists of control means which control the information which communicates by this 1st means of communications, the 2nd means of communications which communicates the information controlled by these control means by non-contact, and a display means to display the information which communicates by this 2nd means of communications, or the information which communicates by the 1st means of communications of the above.

[0011] The non-contact information recording device of this invention consists of a read-out means which reads the reference information currently recorded on the non-contact information record medium by non-contact, a display-output means which carries out the display output of the information corresponding to the reference information which read with this read-out means, and a record means record the information by which the display output was carried out with this display-output means by non-contact on the above-mentioned non-contact information record medium if needed.

[0012] The non-contact information recording device of this invention consists of a read-out means which reads the reference information currently recorded on the non-contact information record medium by non-contact, and a printing means which carries out the printout of the documents which need based on the reference information which read with this read-out means.

[0013] The non-contact information recording device of this invention consists of change meanses to change the information currently recorded on the non-contact information record medium with which various information is recorded by the above-mentioned non-contact information record medium non-contact in informational read-out and the non-contact information recording device which performs writing by time.

[0014] In the non-contact information recording device which writes in by reading the non-contact information recording device of this invention to the non-contact information record medium which is recording the term data of borrowing with a time limit, such as a book of a library, by non-contact It consists of a comparison means to compare the term data which read the term data currently recorded on the above-mentioned non-contact information record medium with the read-out means read by non-contact, and this read-out means with the date data built in beforehand, and a display means to display warning according to the result of this comparison means.

[0015] When the non-contact information recording device of this invention detects a user with a detection means detect existence of a user, and this detection means, it consists of a read-out means which reads the reference information recorded on the non-contact information record medium which the above-mentioned user holds by non-contact, and a display-output means is based on the reference information which read with this read-out means, and display or output required information.

[0016] The non-contact information recording device of this invention consists of display-output meanses to display or output information required for the possessor who possesses the above-mentioned non-contact information record medium, only while the above-mentioned non-contact information record medium has reacted to the question signal outputted with an output means to output a question signal to a non-contact information record medium according to non-contact by the fixed time interval, and this output means.

[0017] The non-contact information record medium with which a user possesses the non-contact information record system of this invention, and information is recorded by non-contact,

A non-contact information record means to read the close leaving information of the user who possesses the above-mentioned non-contact information record medium by being provided in the entrance of each part store and performing informational read and writing by the above-mentioned non-contact information record medium and non-contact. It consists of host computers which grasp the state of the above-mentioned each part store on real time using the close leaving information read with this non-contact information record means.

[0018] The vending machine of this invention reads identification information, age information, and prepaid information of the owner currently recorded on the non-contact information record medium which an owner possesses by non-contact, and consists of a non-contact information record means to write in, and a limit means restrict the above-mentioned owner's purchase according to the identification information read with this non-contact information record means, age information, and prepaid information.

[0019]

[Embodiments of the Invention] Hereafter, the gestalt of 1 implementation of this invention is explained with reference to a drawing. Drawing 1 shows the outline of the non-contact information record medium 1 used for this invention. A candidate owns the non-contact information record medium 1 which shows appearance to (a) of drawing 1 as a student identification card. As shown in (b) of drawing 1, the non-contact information record medium 1 consists of an antenna 2, a strange demodulator circuit 3, a control circuit 4, and memory 5. The memory map memorized by memory 5 as shown in (c) of drawing 1 serves as a memory address 11, the individual ID information 12, the prepaid data 13, the term conditional data 14, the close leaving time temporary storage 15, and others 16.

[0020] Drawing 2 shows the non-contact information record terminal (equipment) 20 including the function to write the information on the non-contact information record medium 1 concerning this invention. A terminal (equipment) including the function of this non-contact information record terminal 20 is arranged and installed within the campus.

[0021] As shown in (a) of drawing 2, the non-contact information record terminal 20 consists of the transceiver section 21 to the non-contact information record medium 1, a display 22 which displays various information, and a control unit 23.

[0022] As shown in (b) of drawing 2, the circuitry of the non-contact information record terminal 20 consists of transceiver circuits 25 with an antenna 24 and —. The transceiver circuit 25 has the control circuit 26 which controls the whole. A control circuit 26 transmits to the non-contact information record medium 1 through an antenna 24 using a modulation circuit 27, and receives the electric wave from the non-contact information record medium 1 through an antenna 24 using a demodulator circuit 28. Moreover, the manager terminal 31 and — are connected to the control circuit 26 through the memory 29 and the network 30 which memorize data.

[0023] Drawing 3 shows the conceptual diagram of an overall system which used the non-contact information record medium 1 and the non-contact information record terminal 20. First, in the intramural classroom 32, manager terminal 31a and RWU terminal 40a are prepared, it connects with the central centralized-control host computer 50 through a network, and attendance-and-absence management of a candidate is performed. RWU (Reader Writer Unit) terminal 40a is a terminal (equipment) including the function of the non-contact information record terminal 20.

[0024] Manager terminal 31b and RWU terminal 40b are prepared in a library 33, it connects with the central centralized-control host computer 50 through a network, and a close discharge control and loan management of a book are performed. -

[0025] In front of an office, in addition to this, by 34, in addition to this, RWU terminal 40c is prepared in front of an office, manager terminal 31c is prepared in an office, it connects with the central centralized-control host computer 50 through a network, and the electronic bulletin board for individuals can mainly be seen.

[0026] In the off-limits area 35, 40d of RWU terminals is prepared in area, 31d of manager terminals connects with the inside central centralized-control host computer 50 through a network, and a security management is performed with them.

[0027] In 36, manager terminal 31e and RWU terminal 40e are prepared, it connects with the central centralized-control host computer 50 through a network, and a candidate dining-room, a stand, a copy machine, telephone, etc. can use the student identification card of the non-contact information record medium 1 as a prepaid card with charged institutions, such as a candidate dining-room.

[0028] 40f of RWU terminals and the individual information retrieval terminal 38 are formed, it connects with the central centralized-control host computer 50 through a network, and individual information can be searched with 37, such as a laboratory, from the distant place.

[0029] About the system in each place, more detailed explanation is given to below. Drawing 4 shows the system in the classroom 32 where a candidate receives a lesson. That is, the RWU terminal 42 which installed the antenna 41 in the surroundings of the door (for example) receptacle of the entrance of a classroom 32 as shown in (a) of drawing 4 is attached. This performs attendance-and-absence management of a candidate. As shown in (b) of drawing 4, terminal 31a for managers connected with this RWU terminal 42 is installed in the platform in a classroom 32. This terminal 31a for managers is allowed only for a manager (staff of a school) to use, and the information of those who are present in a classroom etc. can output it to real time at output devices, such as a display. Moreover, an effective time [to consider as attendance] setup can also be performed.

[0030] Moreover, as shown in (c) of drawing 4, RWU (terminal) 43 and an antenna 44 are attached in the upper surface or the undersurface of a desk of a participant, and position grasp of which candidate is sitting on the desk of what is also attained by managing by manager terminal 31a. Moreover, on the desk, Light Emitting Diode (light emitting diode) 45 used for an attendance-and-absence check etc. is formed.

[0031] Loan / return management of a book is performed by installing the system which manages ON ***** by the system same in a library 33 as the attendance-and-absence management performed in the classroom 32 where a candidate receives a lesson, and the terminal which has the function of the non-contact information record terminal 20, and writing in the data of the student identification card which is the non-contact information record medium 1, and the book lent out to both manager terminal 31b.

[0032] Drawing 5 shows the synthetic RWU terminal (equipment) 51 which displays a bulletin board etc. A central campus etc. installs this in the place 34 where a candidate carries or passes along a leg well in the case of ***** in front of an office. It consists of whether persons, such as RW-ANT (reader writer antenna) 52 which sends and receives the signal which write as composition the data in the student identification card which is the non-contact information record medium 1, the display 53 as a display means, the printer 54 as a printing means which can take out a certificate, the voice guide loudspeaker 55, an input key 56, and infrared radiation, stood in front of the non-contact information record terminal 51, a person detection sensor 57 to detect.

[0033] Next, in such composition, processing operation in the RWU terminal 51 is explained with reference to the flow chart of drawing 6 and drawing 7. First, processing displays the notice and advertisement which were turned on the display 53 at the general candidate on the initial state (at the time of the state where nobody uses) (ST1).

[0034] Here, as shown in drawing 8, work of the person detection sensor 57 (this can consider an infrared sensor etc.) is shown. As shown in (a) of drawing 8, only when a person stands within a fixed distance right in front exactly, the RWU terminal 51 is operated. Therefore, as shown in (b) of drawing 8, even if only the non-contact information record medium 1 exists, the RWU terminal 51 does not start operation. I hear that it cannot be operated unless this is located on malfunction prevention and the front, and it looks into it from others, and it can perform protection of privacy, such as prevention.

[0035] A reaction of this person detection sensor 57 transmits a signal (question signal) which starts the circuit in the non-contact information record medium (student identification card) 1 from RW-ANT52 (ST3). If the non-contact information record medium 1 reacts at this time, the signal which includes the individual ID information 12 in RW-ANT52 from this non-contact information record medium 1 will be returned.

[0036] In addition, RWU-ANT52 is designed so that it can detect, if the owner of a student identification card puts the non-contact information record medium (student identification card) 1 into receptacles other than the receptacle which conductivity has and it puts into the chest pocket or the pocket of a bodily front face. However, since it is possible that it is close to the body with which it does not have the non-contact information record medium (student identification card) 1, or the non-contact information record medium (student identification card) 1 has conductivity when the reaction from the non-contact information record medium (student identification card) 1 does not come on the contrary, a message, such as "please hold up a student identification card in front of an antenna", is displayed on a display 53.

[0037] the information received by the RWU terminal 51 is checked and a student identification card owner recognizes it to be a formal candidate — having (ST4) — continuing — the RWU terminal 51 — the term from the non-contact information record medium (student identification card) 1 — conditional — data 14 are read (ST5)

[0038] if — the term — conditional — the conditions of data are fulfilled — a warning message will be displayed if it becomes (ST6) (ST7) For example, by the processing on October 13, if the information "the book of valid OO till October 13 was borrowed" is in the term conditional data 14 in the memory 5 of the non-contact information record medium 1, this data will be read to the RWU terminal 51, and a message will be displayed "Today is a return day of the book of OO" on a display 53.

[0039] Drawing 9 shows the main screen 60 displayed on the display 53. The main screen 60 displays ID62, such as the present date and time 61 and a name, the time sharing 63 on the day, and the existence 64 grade of the connection from an office (ST8). Beforehand, the completion subject of the candidate of the ID is registered into the central centralized-control host computer 50, and the time sharing 63 of the day is displayed by searching the database in the central centralized-control host computer 50.

[0040] The lecture situation which shows whether it is under whether the lecture other than the time limit (lecture time zone), a subject name, and the classroom of a lecture was completed or lecture or it is not carried out yet, and the attendance-and-absence state which shows whether attendance and absence are checked are displayed on a time sharing 63.

[0041] A lecture situation is managed by the RWU terminal 42 arranged in each classroom 32, and terminal 31a for managers. for example, when not checked [of the RWU terminal 42 in the classroom where the lecturer (manager) itself gives a lecture by having the non-contact information record medium 1] yet, they are "it is not carried out yet" and "close" ***** — the case where there is nothing "appearance" **** — "under a lecture", close ["close"], and "appearance" — when both checking, it considers as "an end" etc. This lecture situation is transmitted to manager terminal 31c which manages the RWU terminal 51 which serves a bulletin board, a time sharing, etc. on real time through a network from manager terminal 31a for attendance-and-absence management arranged in each classroom. An attendance-and-absence state is similarly managed by the system of drawing 4 .

[0042] It keys a comprehensive menu, when a candidate is going to use other services, such as seeing office connection. a "comprehensive menu" key pushes — having (ST9) — if a personal identification number input is urged to the RWU terminal 51 and the right (ST10) number is inputted, use of a comprehensive menu will be attained (ST11)

[0043] There are items, such as a check (ST15) of a bulletin board (connection from an office) (ST12), certificate issue (ST13), and the book that has attendance-and-absence-checked (ST14) and is borrowed, and prepaid data validation (ST16), in a comprehensive menu.

[0044] In this, if the "bulletin board" of a step ST 12 is chosen, the time-sharing change to the call, the informative matter and the lecture, and seminar participant to the individual by whom the notice was performed to the bulletin board in front of an office, cancellation of a lecture, a report, a test, etc. can be notified conventionally. The candidate who is studying the subject from the completion subject of the man by whom the notice of [in addition to individuals, such as a lecture and a seminar,] is registered into the central centralized-control host computer 50 is searched, and a notice is performed automatically.

[0045] "Certificate issue" of a step ST 13 will publish a student-discount certificate, and

enrollment in school and a results certificate, others and various certificates. "An attendance-and-absence check" of a step ST 14 performs the attendance-and-absence history check over the several weeks past. "A check of prepaid data" of a step ST 16 can check the balance (the remaining frequency).

[0046] Although it processes pushing an "end" button for carrying out regularly (ST17) etc. when the owner of the non-contact information record medium (student identification card) 1 terminates these services, even when it goes away from before a terminal, without taking the necessary procedure for a formal end, it ends after fixed time by the sensor 57 (ST18). Moreover, the guide 55 with voice also performs these processings simultaneously with what is depended on visual output units, such as a display 53.

[0047] Next, in the ingress prohibition area 35 or people's traffic investigation area, the non-contact information record terminal 20 is installed in the place which is visible as for neither Kabeuchi nor the inside of a ceiling (background) using a system being non-contact, and when a person with the non-contact information record medium 1 passes along this, the person's individual ID information 12 is recorded.

[0048] A students' dining hall, a stand, etc. use the non-contact information record medium 1 for the service 36 of the intramural charge as a prepaid card. Although the thing of the former [point / that this non-contact information record medium 1 differs from the conventional prepaid card] will become unusable if money in hand (frequency) is set to 0, it can write money in hand (frequency) in the prepaid data 13 in memory 5 repulling this non-contact information record medium 1 with cash. By this, the non-contact information record medium 1 as a student identification card becomes usable also as a prepaid card.

[0049] Drawing 10 shows the example applied to the vending machine taking advantage of the feature of the non-contact information record medium 1. The case where it considers as the vending machine 70 of tobacco as shown in (a) of drawing 10 is explained. Whether persons, such as an antenna 71, infrared radiation, etc. which send and receive the signal which write the data in the student identification card which is the non-contact information record medium 1, stood in front of the vending machine 70, the person detection sensor 72 to detect, the selection key 73 of tobacco, a coin slot 74, output port 75 of tobacco, and change output port 76 are consisted of by the vending machine 70 of tobacco.

[0050] Operation is explained with reference to the flow chart shown in (b) of drawing 10. That is, when the person detection sensor 72 of the vending machine 70 of tobacco detects a person (ST21), a signal (question signal) which starts the circuit in the non-contact information record medium (student identification card) 1 from an antenna 71 is transmitted (ST22).

[0051] At this time, if the non-contact information record medium 1 reacts, the signal which includes the prepaid data 13 and the individual ID information 12 in an antenna 71 from this non-contact information record medium 1 will be returned, and this data will be read (ST23). Then, from this read individual ID information 12, when possible [purchase by age conditions], and impossible, it divides (ST24). For example, when age is less than 20 years old, suppose that purchase is impossible (ST25).

[0052] If 20 or more years old of age become, based on the read prepaid data 13, purchase processing will be performed and it will end (ST26). In order to receive service equivalent to the RWU terminal 51 installed in the place of an office and others 34 from the laboratory 37 distant from the school building in which a general candidate gathers, the central centralized-control host computer 50 and the network are constructed. It becomes possible to take out the individual data currently recorded on central centralized-control host computer 50 and others with the established or new terminal also in the place 37 from which the laboratory etc. was separated by this.

[0053] The RWU terminals 40a-40f and the manager terminals 31a-31e are connected to each intramural places 32-37 the inside of the place, or out of the place, and each manager terminal 31 is managing the partial information and network of the place. As a whole, each service required with the intramural non-contact information record medium 1 is performing a synthetic network and synthetic information management with the central centralized-control host computer 50.

[0054] Drawing 11 shows the relation between the RWU terminal 51 shown by drawing 5 installed in 34, such as before an office, and its manager terminal 31c. There is a personal-data storage area 82 where the record portions 81, such as a notice performed for general and advertisement, and individual ID82a, prepaid data 82b, notice data 82c, etc. are memorized in the storage 80, such as memory in manager terminal 31c, or auxiliary memory. For example, if individual data are stored in a school register numerical order, the man of the Nth school register number will be stored in Nth area 82N.

[0055] The inside of 1 man-minute of personal data has become like [on the day] attendance-and-absence record 82e and completion subject data 82f and application 82g of others individual ID82a, prepaid data 82b, notice data 82c, and 82d of certificate records.

[0056] In addition to this, the subject data-conversion table 83, the attendance-and-absence management database 84, the certificate database 85, the personal identification number database 86, etc. are stored in the storage 80 in manager terminal 31c.

[0057] The RWU terminal 51 is connected to manager terminal 31c, and manager terminal 31c is further connected to the central centralized-control host computer 50. The main managements of the RWU terminal 51 are performed by manager terminal 31c.

[0058] At the time of an initial state (state that nobody uses), the RWU terminal 51 reads the data of the record portions 81 towards the general candidate memorized by the storage 80 in manager terminal 31c, such as a notice and advertisement, through a network, and displays on the display 53 of the RWU terminal 51 (it corresponds to a step ST 1).

[0059] Next, operation which recognizes the candidate to whom the RWU terminal 51 possessed the non-contact information record medium 1 first is explained with reference to the flow chart of drawing 12. First, the question signal which will start the circuit in the non-contact information record medium 1 from the antenna 52 of the RWU terminal 51 if it is confirmed whether the person detection sensor 57 of the RWU terminal 51 reacted (ST31) and a person is detected is transmitted (ST32). The RWU terminal 51 receives the data of the individual ID information 12 that the non-contact information record medium 1 receives this question signal with an antenna 2, and has saved it in the memory 5 interior, with an antenna 52 by transmitting toward the RWU terminal 51, and data are obtained (ST33).

[0060] Since it is possible to be in the place in which it does not have the non-contact information record medium (student identification card) 1 or which an electric wave does not reach when there is no answer, even if the RWU terminal 51 transmits a question signal, a cautions message, such as "please hold up a student identification card in front of an antenna", is displayed on a display 53 in this case (ST34).

[0061] next, the term in the non-contact information record medium 1 — conditional — processing operation of data 14 is explained with reference to the flow chart of drawing 13. Moreover, the image of processing operation at that time is shown in drawing 14.

[0062] first, the RWU terminal 51 — the non-contact information record medium 1 — a term — conditional — the signal which requires data 14 is transmitted (ST41) The non-contact information record medium 1 answers this, the term conditional data 14 are transmitted toward the RWU terminal 51, and the RWU terminal 51 receives this. Even if the RWU terminal 51 transmits a demand signal, when there is no answer, a cautions message is displayed on a display 53 (ST43).

[0063] the term which received the RWU terminal 51 — conditional — data 14 and the date calendar built in beforehand — comparing — a term — conditional — it judges whether data 14 are that day and expiration (ST44), and the message of warning is displayed when it agrees on conditions (ST45)

[0064] Next, time-sharing management is explained with reference to the flow chart of drawing 15. First, drawing 16 shows the mechanism in which the time sharing on the day in the main time-sharing screens shown in drawing 9 is displayed.

[0065] That is, the subject number 90 of the man's completion subject is memorized by completion subject data 82f in the personal-data storage area 82 of manager terminal 31c, and this is obtained (ST51). Manager terminal 31c looks at operation time 90a of a completion subject using the subject data-conversion table 83 from the obtained subject number 90 (ST52).

[0066] Manager terminal 31c compares this operation time 90a with a built-in calendar, and judges whether it is the subject carried out on the day (today) (ST53), and if it carries out, it will obtain the remaining data, such as subject name 90b, from the subject data-conversion table 83 (ST54), and they will carry out data transfer to the RWU terminal 51 (ST55). It is carried out until a subject number is completed (ST56).

[0067] Drawing 17 shows the system which manages the attendance-and-absence state in a lecture. RWU43 and — which were prepared in each desk which explained this system configuration by drawing 4 are connected with the convergence machine 91 and — through the controller 92 at manager terminal 31a. And it connects with the central centralized-control host computer 50 from manager terminal 31a.

[0068] About an attendance-and-absence state on the day, the attendance-and-absence data stored in on the day attendance-and-absence record 82e of the personal-data storage area 82 are read and displayed. Otherwise with this, attendance-and-absence data are recorded on the attendance-and-absence management database 84. As for this attendance-and-absence management database 84, all the past attendance-and-absence states are also recorded.

[0069] Moreover, the existence 64 of the connection from the office in the display screen 60 shown in drawing 9 is for telling whether there are connection and a notice to the owner individual of the non-contact information record medium 1. The connection and the notice to an individual are in notice data 82c in the personal-data storage area 82 of manager terminal 31c. If there are no data into this, there will be no informative matter, and if data are contained, there will be an informative matter.

[0070] When a candidate is going to use other services of seeing office connection, it keys the comprehensive menu in a step ST 11. If the key which progresses to a comprehensive menu is pushed, a personal identification number input will be urged to the RWU terminal 51, and if the right number is inputted, use of the comprehensive menu of a step ST 11 will be attained.

[0071] As shown in a step 12-STs 16, there are items, such as a check of a bulletin board (connection from an office), certificate issue, and the book that has attendance-and-absence-checked and is borrowed, and prepaid data validation, in a comprehensive menu.

[0072] In this, if the bulletin board of a step ST 12 is chosen, the time-sharing change to the call, the informative matter and the lecture, and seminar participant to the individual by whom the notice was performed to the bulletin board in front of an office by the handicraft, cancellation of a lecture, a report, a test, etc. can be notified conventionally.

[0073] Connection / notice matter is stored in notice data 82c of the personal-data receipt area 82 in manager terminal 31c as drawing 11 showed. When a bulletin board is chosen, the RWU terminal 51 brings and displays data from notice data 82c of the personal-data receipt area 82 corresponding to these each people.

[0074] Drawing 18 shows the example of a notice in case a manager does bulletin board connection. When it is going to connect to the entire man individual now, a manager should just write immediate data in notice data 82c corresponding to the individual. Moreover, connection of the cancellation of a lecture to the candidate who is studying the specific lecture, seminar, etc. searches the candidate who is studying the subject number first, and should write only in the candidate's notice data 82c. That is, in the flow chart of drawing 18, the candidate who is studying the subject number n is searched and bulletin board connection of cancellation of a lecture is carried out to the searched candidate.

[0075] Next, the certificate issue in a step ST 13 publishes a student-discount certificate, and enrollment in school and a results certificate, others and various certificates. Moreover, a charged thing etc. is to publish a certificate like the certificate with which the number of sheets published in one year like a student-discount certificate was decided, and a results certificate.

[0076] Operation of fundamental certificate issue is explained with reference to the flow chart of drawing 19. That is, a personal identification number is inputted (ST61), and if this personal identification number is right (ST62), issue processing of the kind of certificate will be chosen and carried out (ST63).

[0077] In a step ST 63, when it is a certificate with a number-of-sheets limit, it becomes processing of the flow chart shown in drawing 20 of operation. namely, the case where the old

issue number of sheets in 82d of certificate records is investigated (ST64), it investigates whether the excess (excess) of number of sheets is nothing (ST65), and there is no excess of number of sheets — a printout — carrying out (ST66) — issue number of sheets is recorded on 82d of certificate records (ST67)

[0078] Moreover, in the case of a charged certificate, in a step ST 63, it becomes processing of the flow chart shown in drawing 21 of operation. namely, the case where investigate the prepaid data 13 (ST68) and the balance is sufficient for the required frame (ST69) — the certificate database 85 to data — having — publishing (ST70) — issue number of sheets is recorded on 82d of certificate records (ST71)

[0079] Moreover, in the case of a results certificate etc., the certificate database 85 is prepared in manager terminal 31c, and the printout of the data is pulled out and carried out from there. Next, the attendance-and-absence management in a step ST 14 can see its attendance and absence how managed. [past] The method of attendance-and-absence management is recorded [in the RWU terminals 42 and 43 arranged in each classroom] through a network in the attendance-and-absence management database 84 of manager terminal 31c from the manager terminal 31a. Attendance-and-absence management is performed by pulling out and displaying data from the inside of this attendance-and-absence management database 84.

[0080] Next, about the data about the loan book management in a step ST 15, the database of manager terminal 31b in a library 33 is accessed, and the manager terminal 31c → RWU terminal 51 and data which have managed the manager terminal 31b → bulletin board of a library 33 etc. from there are brought and displayed.

[0081] Next, the prepaid data validation in a step ST 16 can see the data in prepaid data 82b of the personal-data storage area 82 of manager terminal 31c by bringing to the RWU terminal 51, and can check its balance.

[0082] Next, in drawing 4 and drawing 17 which were mentioned above, the composition of the attendance-and-absence managerial system in the classroom 32 where a candidate receives a lesson is explained in detail. RWU43 and an antenna 44 are installed in the front face of each desk for the candidates (auditor) of a classroom 32, a rear face, or the interior of ****, and Light Emitting Diode45 for a check is formed in the table of a desk. Moreover, manager terminal 31a is installed in places which a manager tends to operate, such as the platform.

[0083] Each RWU43 is connected to the convergence machine 91 for every (every [for example,] train of a desk) fixed number. Moreover, it connects with the controller 92 which are the convergence machine 91 and a convergence machine final to —, and the controller 92 is connected to manager terminal 31a.

[0084] Each antenna 44 is designed so that there may not be an antenna of the next desk and interference, and when taking attendance and absence, the candidate places the student identification card which is its own non-contact information record medium 1 on the desk with which each one is sitting down. Moreover, when Light Emitting Diode45 for a check on a desk shines, the candidate has also come to be able to do a check, when checked saying "It is attendance."

[0085] Although using only for a manager is allowed and it needs manager terminal 31a for a classroom, it is possible [to output devices, such as a display,] of information etc., and a display is possible for every real time or set-up time.

[0086] Operation when taking attendance from manager terminal 31a with reference to the flow chart of drawing 22 is explained. In addition, drawing 23 shows data-format D treated here. First, a lead instruction is sent to a controller 92 from manager terminal 31a (ST81). Then, controllers 92 give a lead instruction to all the convergence machines 91 all at once (ST82). Each convergence machine 91 begins operation simultaneously altogether by this.

[0087] Operation of the convergence machine 91 sends a lead instruction sequentially from No1 of RWU43 connected (ST84), and leads the individual ID information 12 in the non-contact information record medium 1 on a desk (ST85). At this time, when it is able to lead formally, Light Emitting Diode45 on a desk is made to turn on (ST87), and the data which added the address (for example, No.1, No.2, —) A of the desk to the read individual ID information 12 are stored in the memory in the convergence machine 91 (STs 88 and 90).

[0088] An absent code is made instead of being the individual ID information 12, when it is not able to lead formally (when there being no non-contact information record medium 1 on a desk), and what added the address of a desk to this is stored in the memory in the convergence machine 91 (STs 89 and 90). This operation is performed to the convergence machine 91, all RWU(s)43 connected to —, and — (STs 91 and 92).

[0089] A controller 92 reads the convergence machine 91 connected and the data of — which are in the memory of the convergence machine 91 sequentially from No1, and transmits them to manager terminal 31a as it is (ST93). Manager terminal 31a saves what added the hour entry to the obtained data (ST94), and ends processing. Who is sitting on the desk of what when can check on manager terminal 31a by this.

[0090] Various intramural services are offered by according to the form of implementation of the above-mentioned invention, using a student identification card as a non-contact information record medium, and arranging a RWU (Reader Writer Unit) terminal within the campus, as explained above. In it, conventionally, it is the bulletin board beam which the office personnel were performing, and business, such as certificate issue, is also given to the RWU terminal. If it says only within a bulletin board, only the information for which each people are needed by this can be displayed, information can be chosen automatically beforehand, or various services, such as individual completion subject management which was not able to be performed, can be offered in the conventional bulletin board. Moreover, the non-contact information record system which covers the great portion of services in a school, such as prepaid service in the attendance-and-absence management in each classroom, a students' dining hall, etc., can be built by constructing the network of a RWU terminal besides a bulletin board. By using this non-contact information record system, a candidate becomes possible [leading all intramural lives with one student identification card which is a non-contact information record medium].

[0091] Moreover, by giving the application information needed for the conventional contents and the accounting information and the other conventional school life of a student identification card to a non-contact information record medium, for a manager (school personnel) side, the large increase in efficiency of the office work which required time and time and effort very much can be performed, and the information and documents which he needs quickly also for a user (candidate side) can be obtained conventionally.

[0092] In the electronic bulletin board which mainly puts up the information which a candidate needs, when only information required for an individual is made to display and output or is made required by non-contact in certificates, it becomes possible to receive issue, without taking time.

[0093] In the system which manages attendance and absence, like before, a manager (staff of a school) collects attendance votes, the complicated work of filling in list of names etc. one by one becomes unnecessary, and time effective use of a teacher can be expected.

[0094] By setting accounting information area as the memory of the non-contact information record intermediation inside of the body, unlike the prepaid card of throwing away like before, supply with the feeling of a passbook any number of times, it uses, or ** becomes possible. Moreover, the applied usage which combined with other information memorized by the memory of the non-contact information record intermediation inside of the body becomes possible.

[0095]

[Effect of the Invention] As explained in full detail above, according to this invention, for a manager side, the large increase in efficiency of office work can be attained, and the non-contact information record system which can obtain the information which he needs quickly also for a user, and documents can be offered.

[Translation done.]

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TECHNICAL FIELD

[The technical field to which invention belongs] This invention consists of a non-contact information record medium and a non-contact information record terminal, and relates to the non-contact information record system which write information by non-contact.

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PRIOR ART

[Description of the Prior Art] A candidate's photograph was stuck on paper or the card of plastics, and the conventional student identification card was only that by which individual ID information is printed. When required, the candidate showed the manager of a school this, and I took the examination, or had the certificate published, or he borrowed the book at a library.

[0003] Moreover, the connection bulletin board in a school (especially university) was collectively put up for the place where connection of cancellation of a lecture, connection of report presentation, connection that performs an examination, the call to an individual, etc. are the same in many cases. On the other hand, as for attendance-and-absence management of a candidate, what used papers, such as an attendance-and-absence vote, was common, and the manager (teacher) had taken time and effort to the correspondence work which tests the submitted attendance-and-absence vote and list of names by comparison.

[0004] In the case of the conventional student identification card, the personnel by the side of a school (janitor) had to look at the student identification card by the direct eye, and the owner had to check whether you were him. Moreover, in order to have checked certainly, since the size of a student identification card was small, this had to be directly checked for the hand. This was troublesome also for the personnel by the side of a school (janitor) also for the candidate. Moreover, it was difficult to database-ize the shown contents or the contents of a check of a student identification card, the personnel had to input into the terminal anew, and it took time and effort.

[0005] Moreover, the time and effort of the conventional connection bulletin board being packed into one place, and having the notice of a huge amount, information required for itself looking at whether it is really required information, and something checking it was this thing. It was very crowded especially before the bulletin board in front of the duration of test, and acquiring information required for oneself had taken time. Therefore, the connection to an individual, connection of cancellation of a lecture, etc. were overlooked in many cases.

[0006] Moreover, the work of checking and database-izing a candidate's attendance and absence by the attendance-and-absence vote from which managers were collected in attendance-and-absence management is done, and great time was spent.

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained in full detail above, according to this invention, for a manager side, the large increase in efficiency of office work can be attained, and the non-contact information record system which can obtain the information which he needs quickly also for a user, and documents can be offered.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] As described above, for a manager (school personnel) side, time and time and effort were taken very much to office work, and there was a problem that the information or documents which are needed also for a user (candidate side) could not be obtained quickly.

[0008] Then, this invention can attain the large increase in efficiency of office work for a manager side, and aims at offering the non-contact information record system which can obtain the information which he needs quickly also for a user, and documents.

[Translation done.]

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MEANS

[Means for Solving the Problem] The non-contact information record medium of this invention consists of a storage means to memorize various information, such as the items mentioned as a student identification card, and accounting information, control means which control the information memorized by this storage means, and means of communications which communicates the information controlled by these control means by non-contact.

[0010] The 1st means of communications which communicates information through the host computer and network where the non-contact information recording device of this invention has memorized all candidates' information, It consists of control means which control the information which communicates by this 1st means of communications, the 2nd means of communications which communicates the information controlled by these control means by non-contact, and a display means to display the information which communicates by this 2nd means of communications, or the information which communicates by the 1st means of communications of the above.

[0011] The non-contact information recording device of this invention consists of a read-out means which reads the reference information currently recorded on the non-contact information record medium by non-contact, a display-output means which carries out the display output of the information corresponding to the reference information which read with this read-out means, and a record means record the information by which the display output was carried out with this display-output means by non-contact on the above-mentioned non-contact information record medium if needed.

[0012] The non-contact information recording device of this invention consists of a read-out means which reads the reference information currently recorded on the non-contact information record medium by non-contact, and a printing means which carries out the printout of the documents which need based on the reference information which read with this read-out means.

[0013] The non-contact information recording device of this invention consists of change meanses to change the information currently recorded on the non-contact information record medium with which various information is recorded by the above-mentioned non-contact information record medium non-contact in informational read-out and the non-contact information recording device which performs writing by time.

[0014] In the non-contact information recording device which writes in by reading the non-contact information recording device of this invention to the non-contact information record medium which is recording the term data of borrowing with a time limit, such as a book of a library, by non-contact It consists of a comparison means to compare the term data which read the term data currently recorded on the above-mentioned non-contact information record medium with the read-out means read by non-contact, and this read-out means with the date data built in beforehand, and a display means to display warning according to the result of this comparison means.

[0015] When the non-contact information recording device of this invention detects a user with a detection means detect existence of a user, and this detection means, it consists of a read-out means which reads the reference information recorded on the non-contact information

record medium which the above-mentioned user holds by non-contact, and a display- output means is based on the reference information which read with this read-out means, and display or output required information.

[0016] The non-contact information recording device of this invention consists of display-output means to display or output information required for the possessor who possesses the above-mentioned non-contact information record medium, only while the above-mentioned non-contact information record medium has reacted to the question signal outputted with an output means to output a question signal to a non-contact information record medium according to non-contact by the fixed time interval, and this output means.

[0017] The non-contact information record medium with which a user possesses the non-contact information record system of this invention, and information is recorded by non-contact. A non-contact information record means to read the close leaving information of the user who possesses the above-mentioned non-contact information record medium by being prepared in the entrance of each part store and performing informational read and writing by the above-mentioned non-contact information record medium and non-contact. It consists of host computers which grasp the state of the above-mentioned each part store on real time using the close leaving information read with this non-contact information record means.

[0018] The vending machine of this invention reads identification information, age information, and prepaid information of the owner currently recorded on the non-contact information record medium which an owner possesses by non-contact, and consists of a non-contact information record means to write in, and a limit means restrict the above-mentioned owner's purchase according to the identification information read with this non-contact information record means, age information, and prepaid information.

[0019]

[Embodiments of the Invention] Hereafter, the gestalt of 1 implementation of this invention is explained with reference to a drawing. Drawing 1 shows the outline of the non-contact information record medium 1 used for this invention. A candidate owns the non-contact information record medium 1 which shows appearance to (a) of drawing 1 as a student identification card. As shown in (b) of drawing 1, the non-contact information record medium 1 consists of an antenna 2, a strange demodulator circuit 3, a control circuit 4, and memory 5. The memory map memorized by memory 5 as shown in (c) of drawing 1 serves as a memory address 11, the individual ID information 12, the prepaid data 13, the term conditional data 14, the close leaving time temporary storage 15, and others 16.

[0020] Drawing 2 shows the non-contact information record terminal (equipment) 20 including the function to write the information on the non-contact information record medium 1 concerning this invention. A terminal (equipment) including the function of this non-contact information record terminal 20 is arranged and installed within the campus.

[0021] As shown in (a) of drawing 2, the non-contact information record terminal 20 consists of the transceiver section 21 to the non-contact information record medium 1, a display 22 which displays various information, and a control unit 23.

[0022] As shown in (b) of drawing 2, the circuitry of the non-contact information record terminal 20 consists of transceiver circuits 25 with an antenna 24 and —. The transceiver circuit 25 has the control circuit 26 which controls the whole. A control circuit 26 transmits to the non-contact information record medium 1 through an antenna 24 using a modulation circuit 27, and receives the electric wave from the non-contact information record medium 1 through an antenna 24 using a demodulator circuit 28. Moreover, the manager terminal 31 and — are connected to the control circuit 26 through the memory 29 and the network 30 which memorize data.

[0023] Drawing 3 shows the conceptual diagram of an overall system which used the non-contact information record medium 1 and the non-contact information record terminal 20. First, in the intramural classroom 32, manager terminal 31a and RWU terminal 40a are prepared, it connects with the central centralized-control host computer 50 through a network, and attendance-and-absence management of a candidate is performed. RWU (Reader Writer Unit) terminal 40a is a terminal (equipment) including the function of the non-contact information

record terminal 20.

[0024] Manager terminal 31b and RWU terminal 40b are prepared in a library 33, it connects with the central centralized-control host computer 50 through a network, and a close discharge control and loan management of a book are performed.

[0025] In front of an office, in addition to this, by 34, in addition to this, RWU terminal 40c is prepared in front of an office, manager terminal 31c is prepared in an office, it connects with the central centralized-control host computer 50 through a network, and the electronic bulletin board for individuals can mainly be seen.

[0026] In the off-limits area 35, 40d of RWU terminals is prepared in area, 31d of manager terminals connects with the inside central centralized-control host computer 50 through a network, and a security management is performed with them.

[0027] In 36, manager terminal 31e and RWU terminal 40e are prepared, it connects with the central centralized-control host computer 50 through a network, and a candidate dining-room, a stand, a copy machine, telephone, etc. can use the student identification card of the non-contact information record medium 1 as a prepaid card with charged institutions, such as a candidate dining-room.

[0028] 40f of RWU terminals and the individual information retrieval terminal 38 are formed, it connects with the central centralized-control host computer 50 through a network, and individual information can be searched with 37, such as a laboratory, from the distant place.

[0029] About the system in each place, more detailed explanation is given to below. Drawing 4 shows the system in the classroom 32 where a candidate receives a lesson. That is, the RWU terminal 42 which installed the antenna 41 in the surroundings of the door (for example) receptacle of the entrance of a classroom 32 as shown in (a) of drawing 4 is attached. This performs attendance-and-absence management of a candidate. As shown in (b) of drawing 4, terminal 31a for managers connected with this RWU terminal 42 is installed in the platform in a classroom 32. This terminal 31a for managers is allowed only for a manager (staff of a school) to use, and the information of those who are present in a classroom etc. can output it to real time at output devices, such as a display. Moreover, an effective time [to consider as attendance] setup can also be performed.

[0030] Moreover, as shown in (c) of drawing 4, RWU (terminal) 43 and an antenna 44 are attached in the upper surface or the inferior surface of tongue of a desk of a participant, and position grasp of which candidate is sitting on the desk of what is also attained by managing by manager terminal 31a. Moreover, on the desk, Light Emitting Diode (light emitting diode) 45 used for an attendance-and-absence check etc. is formed.

[0031] Loan / return management of a book is performed by installing the system which manages ON **** by the system same in a library 33 as the attendance-and-absence management performed in the classroom 32 where a candidate receives a lesson, and the terminal which has the function of the non-contact information record terminal 20, and writing in the data of the student identification card which is the non-contact information record medium 1, and the book lent out to both manager terminal 31b.

[0032] Drawing 5 shows the synthetic RWU terminal (equipment) 51 which displays a bulletin board etc. A central campus etc. installs this in the place 34 where a candidate carries or pass along a leg well in the case of ***** in front of an office. It consists of whether persons, such as RW-ANT (reader writer antenna) 52 which sends and receives the signal which write as composition the data in the student identification card which is the non-contact information record medium 1, the display 53 as a display means, the printer 54 as a printing means which can take out a certificate, the voice guide loudspeaker 55, an input key 56, and infrared radiation, stood in front of the non-contact information record terminal 51, a person detection sensor 57 to detect.

[0033] Next, in such composition, processing operation in the RWU terminal 51 is explained with reference to the flow chart of drawing 6 and drawing 7. First, processing displays the notice and advertisement which were turned on the display 53 at the general candidate on the initial state (at the time of the state where nobody uses) (ST1).

[0034] Here, as shown in drawing 8, work of the person detection sensor 57 (this can consider

an infrared sensor etc.) is shown. As shown in (a) of drawing 8, only when a person stands within a fixed distance right in front exactly, the RWU terminal 51 is operated. Therefore, as shown in (b) of drawing 8, even if only the non-contact information record medium 1 exists, the RWU terminal 51 does not start operation. I hear that it cannot be operated unless this is located on malfunction prevention and the front, and it looks into it from others, and it can perform protection of privacy, such as prevention.

[0035] A reaction of this person detection sensor 57 transmits a signal (question signal) which starts the circuit in the non-contact information record medium (student identification card) 1 from RW-ANT52 (ST3). If the non-contact information record medium 1 reacts at this time, the signal which includes the individual ID information 12 in RW-ANT52 from this non-contact information record medium 1 will be returned.

[0036] In addition, RWU-ANT52 is designed so that it can detect, if the owner of a student identification card puts the non-contact information record medium (student identification card) 1 into receptacles other than the receptacle which conductivity has and it puts into the chest pocket or the pocket of a bodily front face. However, since it is possible that it is close to the body with which it does not have the non-contact information record medium (student identification card) 1, or the non-contact information record medium (student identification card) 1 has conductivity when the reaction from the non-contact information record medium (student identification card) 1 does not come on the contrary, a message, such as "please hold up a student identification card in front of an antenna", is displayed on a display 53.

[0037] the information received by the RWU terminal 51 is checked and a student identification card owner recognizes it to be a formal candidate — having (ST4) — continuing — the RWU terminal 51 — the term from the non-contact information record medium (student identification card) 1 — conditional — data 14 are read (ST5)

[0038] if — the term — conditional — the conditions of data are fulfilled — a warning message will be displayed if it becomes (ST6) (ST7) For example, by the processing on October 13, if the information "the book of valid OO till October 13 was borrowed" is in the term conditional data 14 in the memory 5 of the non-contact information record medium 1, this data will be read to the RWU terminal 51, and a message will be displayed "Today is a return day of the book of OO" on a display 53.

[0039] Drawing 9 shows the main screen 60 displayed on the display 53. The main screen 60 displays ID62, such as the present date and time 61 and a name, the time sharing 63 on the day, and the existence 64 grade of the connection from an office (ST8). Beforehand, the completion subject of the candidate of the ID is registered into the central centralized-control host computer 50, and the time sharing 63 of the day is displayed by searching the database in the central centralized-control host computer 50.

[0040] The lecture situation which shows whether it is under whether the lecture other than the time limit (lecture time zone), a subject name, and the classroom of a lecture was completed or lecture or it is not carried out yet, and the attendance-and-absence state which shows whether attendance and absence are checked are displayed on a time sharing 63.

[0041] A lecture situation is managed by the RWU terminal 42 arranged in each classroom 32, and terminal 31a for managers. for example, when not checked [of the RWU terminal 42 in the classroom where the lecturer (manager) itself gives a lecture by having the non-contact information record medium 1] yet, they are "it is not carried out yet" and "close" ***** — the case where there is nothing "appearance" **** — "under a lecture", close ["close"], and "appearance" — when both checking, it considers as "an end" etc. This lecture situation is transmitted to manager terminal 31c which manages the RWU terminal 51 which serves a bulletin board, a time sharing, etc. on real time through a network from manager terminal 31a for attendance-and-absence management arranged in each classroom. An attendance-and-absence state is similarly managed by the system of drawing 4.

[0042] It keys a comprehensive menu, when a candidate is going to use other services, such as seeing office connection. a "comprehensive menu" key push — having (ST9) — if a personal identification number input is urged to the RWU terminal 51 and the right (ST10) number is inputted, use of a comprehensive menu will be attained (ST11)

[0043] There are items, such as a check (ST15) of a bulletin board (connection from an office) (ST12), certificate issue (ST13), and the book that has attendance-and-absence-checked (ST14) and is borrowed, and prepaid data validation (ST16), in a comprehensive menu.

[0044] In this, if the "bulletin board" of a step ST 12 is chosen, the time-sharing change to the call, the informative matter and the lecture, and seminar participant to the individual by whom the notice was performed to the bulletin board in front of an office, cancellation of a lecture, a report, a test, etc. can be notified conventionally. The candidate who is studying the subject from the completion subject of the man by whom the notice of [in addition to individuals, such as a lecture and a seminar,] is registered into the central centralized-control host computer 50 is searched, and a notice is performed automatically.

[0045] "Certificate issue" of a step ST 13 will publish a student-discount certificate, and enrollment in school and a results certificate, others and various certificates. "An attendance-and-absence check" of a step ST 14 performs the attendance-and-absence history check over the several weeks past. "A check of prepaid data" of a step ST 16 can check the balance (the remaining frequency).

[0046] Although it processes pushing an "end" button for carrying out regularly (ST17) etc. when the owner of the non-contact information record medium (student identification card) 1 terminates these services, even when it goes away from before a terminal, without taking the necessary procedure for a formal end, it ends after fixed time by the sensor 57 (ST18). Moreover, the guide 55 with voice also performs these processings simultaneously with what is depended on visual output units, such as a display 53.

[0047] Next, in the ingress prohibition area 35 or people's traffic investigation area, the non-contact information record terminal 20 is installed in the place which is visible as for neither Kabeuchi nor the inside of a ceiling (background) using a system being non-contact, and when a person with the non-contact information record medium 1 passes along this, the person's individual ID information 12 is recorded.

[0048] A students' dining hall, a stand, etc. use the non-contact information record medium 1 for the service 36 of the intramural charge as a prepaid card. Although the thing of the former [point / that this non-contact information record medium 1 differs from the conventional prepaid card] will become unusable if money in hand (frequency) is set to 0, it can write money in hand (frequency) in the prepaid data 13 in memory 5 repulling this non-contact information record medium 1 with cash. By this, the non-contact information record medium 1 as a student identification card becomes usable also as a prepaid card.

[0049] Drawing 10 shows the example applied to the vending machine taking advantage of the feature of the non-contact information record medium 1. The case where it considers as the vending machine 70 of tobacco as shown in (a) of drawing 10 is explained. Whether persons, such as an antenna 71, infrared radiation, etc. which send and receive the signal which write the data in the student identification card which is the non-contact information record medium 1, stood in front of the vending machine 70, the person detection sensor 72 to detect, the selection key 73 of tobacco, a coin slot 74, output port 75 of tobacco, and change output port 76 are consisted of by the vending machine 70 of tobacco.

[0050] Operation is explained with reference to the flow chart shown in (b) of drawing 10. That is, when the person detection sensor 72 of the vending machine 70 of tobacco detects a person (ST21), a signal (question signal) which starts the circuit in the non-contact information record medium (student identification card) 1 from an antenna 71 is transmitted (ST22).

[0051] At this time, if the non-contact information record medium 1 reacts, the signal which includes the prepaid data 13 and the individual ID information 12 in an antenna 71 from this non-contact information record medium 1 will be returned, and this data will be read (ST23). Then, from this read individual ID information 12, when possible [purchase by age conditions], and impossible, it divides (ST24). For example, when age is less than 20 years old, suppose that purchase is impossible (ST25).

[0052] If 20 or more years old of age become, based on the read prepaid data 13, purchase processing will be performed and it will end (ST26). In order to receive service equivalent to the RWU terminal 51 installed in the place of an office and others 34 from the laboratory 37 distant

from the school building in which a general candidate gathers, the central centralized-control host computer 50 and the network are constructed. It becomes possible to take out the individual data currently recorded on central centralized-control host computer 50 and others with the established or new terminal also in the place 37 from which the laboratory etc. was separated by this.

[0053] The RWU terminals 40a-40f and the manager terminals 31a-31e are connected to each intramural places 32-37 the inside of the place, or out of the place, and each manager terminal 31 is managing the partial information and network of the place. As a whole, each service required with the intramural non-contact information record medium 1 is performing a synthetic network and synthetic information management with the central centralized-control host computer 50.

[0054] Drawing 11 shows the relation between the RWU terminal 51 shown by drawing 5 installed in 34, such as before an office, and its manager terminal 31c. There is a personal-data storage area 82 where the record portions 81, such as a notice performed for general and advertisement, and individual ID82a, prepaid data 82b, notice data 82c, etc. are memorized in the storage 80, such as memory in manager terminal 31c, or auxiliary memory. For example, if individual data are stored in a school register numerical order, the man of the Nth school register number will be stored in Nth area 82N.

[0055] The inside of 1 man-minute of personal data has become like [on the day] attendance-and-absence record 82e and completion subject data 82f and application 82g of others individual ID82a, prepaid data 82b, notice data 82c, and 82d of certificate records.

[0056] In addition to this, the subject data-conversion table 83, the attendance-and-absence management database 84, the certificate database 85, the personal identification number database 86, etc. are stored in the storage 80 in manager terminal 31c.

[0057] The RWU terminal 51 is connected to manager terminal 31c, and manager terminal 31c is further connected to the central centralized-control host computer 50. The main managements of the RWU terminal 51 are performed by manager terminal 31c.

[0058] At the time of an initial state (state that nobody uses), the RWU terminal 51 reads the data of the record portions 81 towards the general candidate memorized by the storage 80 in manager terminal 31c, such as a notice and advertisement, through a network, and displays on the display 53 of the RWU terminal 51 (it corresponds to a step ST 1).

[0059] Next, operation which recognizes the candidate to whom the RWU terminal 51 possessed the non-contact information record medium 1 first is explained with reference to the flow chart of drawing 12. First, the question signal which will start the circuit in the non-contact information record medium 1 from the antenna 52 of the RWU terminal 51 if it is confirmed whether the person detection sensor 57 of the RWU terminal 51 reacted (ST31) and a person is detected is transmitted (ST32). The RWU terminal 51 receives the data of the individual ID information 12 that the non-contact information record medium 1 receives this question signal with an antenna 2, and has saved it in the memory 5 interior, with an antenna 52 by transmitting toward the RWU terminal 51, and data are obtained (ST33).

[0060] Since it is possible to be in the place in which it does not have the non-contact information record medium (student identification card) 1 or which an electric wave does not reach when there is no answer, even if the RWU terminal 51 transmits a question signal, a cautions message, such as "please hold up a student identification card in front of an antenna", is displayed on a display 53 in this case (ST34).

[0061] next, the term in the non-contact information record medium 1 — conditional — processing operation of data 14 is explained with reference to the flow chart of drawing 13. Moreover, the image of processing operation at that time is shown in drawing 14.

[0062] first, the RWU terminal 51 — the non-contact information record medium 1 — a term — conditional — the signal which requires data 14 is transmitted (ST41) The non-contact information record medium 1 answers this, the term conditional data 14 are transmitted toward the RWU terminal 51, and the RWU terminal 51 receives this. Even if the RWU terminal 51 transmits a demand signal, when there is no answer, a cautions message is displayed on a display 53 (ST43).

[0063] the term which received the RWU terminal 51 — conditional — data 14 and the date calendar built in beforehand — comparing — a term — conditional — it judges whether data 14 are that day and expiration (ST44), and the message of warning is displayed when it agrees on conditions (ST45)

[0064] Next, time-sharing management is explained with reference to the flow chart of drawing 15. First, drawing 16 shows the mechanism in which the time sharing on the day in the main time-sharing screens shown in drawing 9 is displayed.

[0065] That is, the subject number 90 of the man's completion subject is memorized by completion subject data 82f in the personal-data storage area 82 of manager terminal 31c, and this is obtained (ST51). Manager terminal 31c looks at operation time 90a of a completion subject using the subject data-conversion table 83 from the obtained subject number 90 (ST52).

[0066] Manager terminal 31c compares this operation time 90a with a built-in calendar, and judges whether it is the subject carried out on the day (today) (ST53), and if it carries out, it will obtain the remaining data, such as subject name 90b, from the subject data-conversion table 83 (ST54), and they will carry out data transfer to the RWU terminal 51 (ST55). It is carried out until a subject number is completed (ST56).

[0067] Drawing 17 shows the system which manages the attendance-and-absence state in a lecture. RWU43 and — which were prepared in each desk which explained this system configuration by drawing 4 are connected with the convergence machine 91 and — through the controller 92 at manager terminal 31a. And it connects with the central centralized-control host computer 50 from manager terminal 31a.

[0068] About an attendance-and-absence state on the day, the attendance-and-absence data stored in on the day attendance-and-absence record 82e of the personal-data storage area 82 are read and displayed. Otherwise with this, attendance-and-absence data are recorded on the attendance-and-absence management database 84. As for this attendance-and-absence management database 84, all the past attendance-and-absence states are also recorded.

[0069] Moreover, the existence 64 of the connection from the office in the display screen 60 shown in drawing 9 is for telling whether there are connection and a notice to the owner individual of the non-contact information record medium 1. The connection and the notice to an individual are in notice data 82c in the personal-data storage area 82 of manager terminal 31c. If there are no data into this, there will be no informative matter, and if data are contained, there will be an informative matter.

[0070] When a candidate is going to use other services of seeing office connection, it keys the comprehensive menu in a step ST 11. If the key which progresses to a comprehensive menu is pushed, a personal identification number input will be urged to the RWU terminal 51, and if the right number is inputted, use of the comprehensive menu of a step ST 11 will be attained.

[0071] As shown in a step 12-STs 16, there are items, such as a check of a bulletin board (connection from an office), certificate issue, and the book that has attendance-and-absence-checked and is borrowed, and prepaid data validation, in a comprehensive menu.

[0072] In this, if the bulletin board of a step ST 12 is chosen, the time-sharing change to the call, the informative matter and the lecture, and seminar participant to the individual by whom the notice was performed to the bulletin board in front of an office by the handicraft, cancellation of a lecture, a report, a test, etc. can be notified conventionally.

[0073] Connection / notice matter is stored in notice data 82c of the personal-data receipt area 82 in manager terminal 31c as drawing 11 showed. When a bulletin board is chosen, the RWU terminal 51 brings and displays data from notice data 82c of the personal-data receipt area 82 corresponding to these each people.

[0074] Drawing 18 shows the example of a notice in case a manager does bulletin board connection. When it is going to connect to the entire man individual now, a manager should just write immediate data in notice data 82c corresponding to the individual. Moreover, connection of the cancellation of a lecture to the candidate who is studying the specific lecture, seminar, etc. searches the candidate who is studying the subject number first, and should write only in the candidate's notice data 82c. That is, in the flow chart of drawing 18, the candidate who is studying the subject number n is searched and bulletin board connection of cancellation of a

lecture is carried out to the searched candidate.

[0075] Next, the certificate issue in a step ST 13 publishes a student-discount certificate, and enrollment in school and a results certificate, others and various certificates. Moreover, a charged thing etc. is to publish a certificate like the certificate with which the number of sheets published in one year like a student-discount certificate was decided, and a results certificate.

[0076] Operation of fundamental certificate issue is explained with reference to the flow chart of drawing 19. That is, a personal identification number is inputted (ST61), and if this personal identification number is right (ST62), issue processing of the kind of certificate will be chosen and carried out (ST63).

[0077] In a step ST 63, when it is a certificate with a number-of-sheets limit, it becomes processing of the flow chart shown in drawing 20 of operation. namely, the case where the old issue number of sheets in 82d of certificate records is investigated (ST64), it investigates whether the excess (excess) of number of sheets is nothing (ST65), and there is no excess of number of sheets — a printout — carrying out (ST66) — issue number of sheets is recorded on 82d of certificate records (ST67)

[0078] Moreover, in the case of a charged certificate, in a step ST 63, it becomes processing of the flow chart shown in drawing 21 of operation. namely, the case where investigate the prepaid data 13 (ST68) and the balance is sufficient for the required frame (ST69) — the certificate database 85 to data — having — publishing (ST70) — issue number of sheets is recorded on 82d of certificate records (ST71)

[0079] Moreover, in the case of a results certificate etc., the certificate database 85 is prepared in manager terminal 31c, and the printout of the data is pulled out and carried out from there. Next, the attendance-and-absence management in a step ST 14 can see its attendance and absence how managed. [past] The method of attendance-and-absence management is recorded [in the RWU terminals 42 and 43 arranged in each classroom] through a network in the attendance-and-absence management database 84 of manager terminal 31c from the manager terminal 31a. Attendance-and-absence management is performed by pulling out and displaying data from the inside of this attendance-and-absence management database 84.

[0080] Next, about the data about the loan book management in a step ST 15, the database of manager terminal 31b in a library 33 is accessed, and the manager terminal 31c → RWU terminal 51 and data which have managed the manager terminal 31b → bulletin board of a library 33 etc. from there are brought and displayed.

[0081] Next, the prepaid data validation in a step ST 16 can see the data in prepaid data 82b of the personal-data storage area 82 of manager terminal 31c by bringing to the RWU terminal 51, and can check its balance.

[0082] Next, in drawing 4 and drawing 17 which were mentioned above, the composition of the attendance-and-absence managerial system in the classroom 32 where a candidate receives a lesson is explained in detail. RWU43 and an antenna 44 are installed in the front face of each desk for the candidates (auditor) of a classroom 32, a rear face, or the interior of ****, and Light Emitting Diode45 for a check is formed in the table of a desk. Moreover, manager terminal 31a is installed in places which a manager tends to operate, such as the platform.

[0083] Each RWU43 is connected to the convergence machine 91 for every (every [for example,] train of a desk) fixed number. Moreover, it connects with the controller 92 which are the convergence machine 91 and a convergence machine final to —, and the controller 92 is connected to manager terminal 31a.

[0084] Each antenna 44 is designed so that there may not be an antenna of the next desk and interference, and when taking attendance and absence, the candidate places the student identification card which is its own non-contact information record medium 1 on the desk with which each one is sitting down. Moreover, when Light Emitting Diode45 for a check on a desk shines, the candidate has also come to be able to do a check, when checked saying "It is attendance."

[0085] Although using only for a manager is allowed and it needs manager terminal 31a for a classroom, it is possible [to output devices, such as a display,] of information etc., and a display is possible for every real time or set-up time.

[0086] Operation when taking attendance from manager terminal 31a with reference to the flow chart of drawing 22 is explained. In addition, drawing 23 shows data-format D treated here. First, a lead instruction is sent to a controller 92 from manager terminal 31a (ST81). Then, controllers 92 give a lead instruction to all the convergence machines 91 all at once (ST82). Each convergence machine 91 begins operation simultaneously altogether by this.

[0087] Operation of the convergence machine 91 sends a lead instruction sequentially from No1 of RWU43 connected (ST84), and leads the individual ID information 12 in the non-contact information record medium 1 on a desk (ST85). At this time, when it is able to lead formally, Light Emitting Diode45 on a desk is made to turn on (ST87), and the data which added the address (for example, No.1, No.2, —) A of the desk to the read individual ID information 12 are stored in the memory in the convergence machine 91 (STs 88 and 90).

[0088] An absent code is made instead of being the individual ID information 12, when it is not able to lead formally (when there being no non-contact information record medium 1 on a desk), and what added the address of a desk to this is stored in the memory in the convergence machine 91 (STs 89 and 90). This operation is performed to the convergence machine 91, all RWU(s)43 connected to —, and — (STs 91 and 92).

[0089] A controller 92 reads the convergence machine 91 connected and the data of — which are in the memory of the convergence machine 91 sequentially from No1, and transmits them to manager terminal 31a as it is (ST93). Manager terminal 31a saves what added the hour entry to the obtained data (ST94), and ends processing. Who is sitting on the desk of what when can check on manager terminal 31a by this.

[0090] Various intramural services are offered by according to the gestalt of implementation of the above-mentioned invention, using a student identification card as a non-contact information record medium, and arranging a RWU (Reader Writer Unit) terminal within the campus, as explained above. In it, conventionally, it is the bulletin board beam which the office personnel were performing, and business, such as certificate issue, is also given to the RWU terminal. If it says only within a bulletin board, only the information for which each people are needed by this can be displayed, information can be chosen automatically beforehand, or various services, such as individual completion subject management which was not able to be performed, can be offered in the conventional bulletin board. Moreover, the non-contact information record system which covers the great portion of services in a school, such as prepaid service in the attendance-and-absence management in each classroom, a students' dining hall, etc., can be built by constructing the network of a RWU terminal besides a bulletin board. By using this non-contact information record system, a candidate becomes possible [leading all intramural lives with one student identification card which is a non-contact information record medium].

[0091] Moreover, by giving the application information needed for the conventional content and the accounting information and the other conventional school life of a student identification card to a non-contact information record medium, for a manager (school personnel) side, the large increase in efficiency of the office work which required time and time and effort very much can be performed, and the information and documents which he needs quickly also for a user (candidate side) can be obtained conventionally.

[0092] In the electronic bulletin board which mainly puts up the information which a candidate needs, when only information required for an individual is made to display and output or is made required by non-contact in certificates, it becomes possible to receive issue, without taking time.

[0093] In the system which manages attendance and absence, like before, a manager (staff of a school) collects attendance votes, the complicated work of filling in list of names etc. one by one becomes unnecessary, and time effective use of a teacher can be expected.

[0094] By setting accounting information as a as the memory of the non-contact information record intermediation inside of the body, unlike the prepaid card of throwing away like before, supply with the feeling of a passbook any number of times, it uses, or ** becomes possible. Moreover, the applied usage which combined with other information memorized by the memory of the non-contact information record intermediation inside of the body becomes possible.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

- [Drawing 1] Drawing showing the outline composition of the non-contact information record medium used for this invention.
- [Drawing 2] Drawing showing the composition of a non-contact information record terminal including the function to write the information on the non-contact information record medium concerning this invention.
- [Drawing 3] The conceptual diagram of the overall system using the non-contact information record medium and the non-contact information record terminal.
- [Drawing 4] Drawing showing the system in the classroom where a candidate receives a lesson.
- [Drawing 5] Drawing showing the synthetic RWU terminal which displays a bulletin board etc.
- [Drawing 6] The flow chart for explaining processing operation in a RWU terminal.
- [Drawing 7] The flow chart for explaining processing operation in a RWU terminal.
- [Drawing 8] Drawing for explaining operation of a person detection sensor.
- [Drawing 9] Drawing showing the main screen displayed on the display.
- [Drawing 10] Drawing for explaining the example applied to the vending machine taking advantage of the feature of a non-contact information record medium.
- [Drawing 11] Drawing for explaining the relation between the RWU terminal installed in front of an office etc., and its manager terminal.
- [Drawing 12] The flow chart for explaining operation which recognizes the candidate to whom the RWU terminal possessed the non-contact information record medium.
- [Drawing 13] the term of the non-contact information record intermediation inside of the body — conditional — the flow chart for explaining processing operation of data
- [Drawing 14] a term — conditional — drawing showing the image of processing operation of data
- [Drawing 15] The flow chart for explaining time-sharing management.
- [Drawing 16] Drawing showing the mechanism in which the time sharing on the day in the main time-sharing screens is displayed.
- [Drawing 17] Drawing showing the system which manages the attendance-and-absence state in a lecture.
- [Drawing 18] The flow chart for explaining the example of a notice in case a manager does bulletin board connection.
- [Drawing 19] The flow chart for explaining operation of fundamental certificate issue.
- [Drawing 20] The flow chart for explaining operation of the certificate issue with a number-of-sheets limit.
- [Drawing 21] The flow chart for explaining operation of charged certificate issue.
- [Drawing 22] The flow chart for explaining operation when taking attendance from a manager terminal.
- [Drawing 23] Drawing showing data format.
- [Description of Notations]
- 1 — Non-contact information record medium (student identification card)
- 2 — Antenna

3 — Strange demodulator circuit
4 — Control circuit
5 — Memory
20 — Non-contact information record terminal
31a-31e — Manager terminal
40a - 40 f—RWU terminal
42 51 — RWU terminal
43 — RWU
44 — Antenna
45 — Light Emitting Diode
50 — Central centralized-control host computer
52 — RW-ANT (reader writer antenna)
53 — Display
57 — Person detection sensor

[Translation done.]

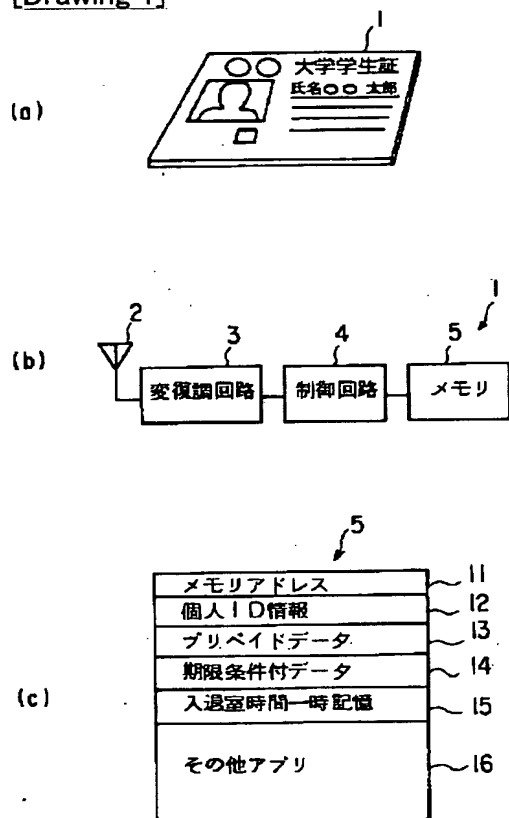
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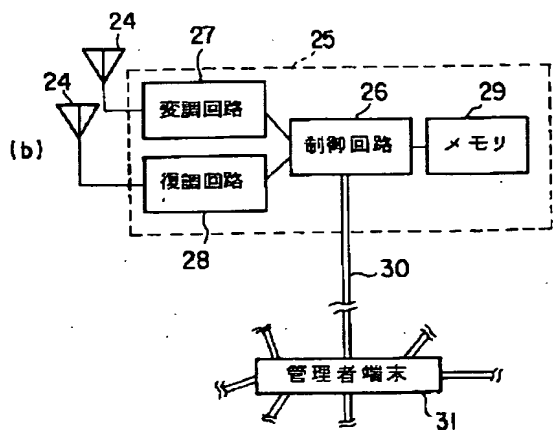
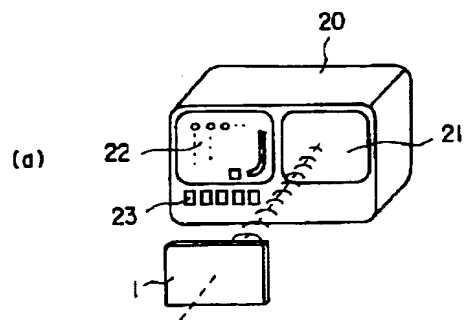
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2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

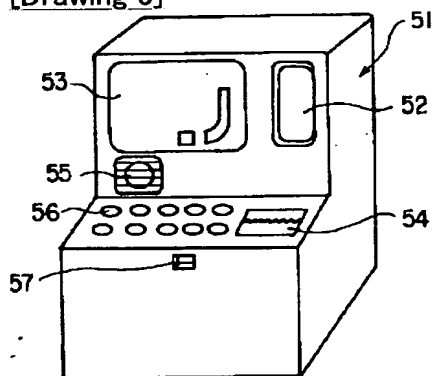
[Drawing 1]



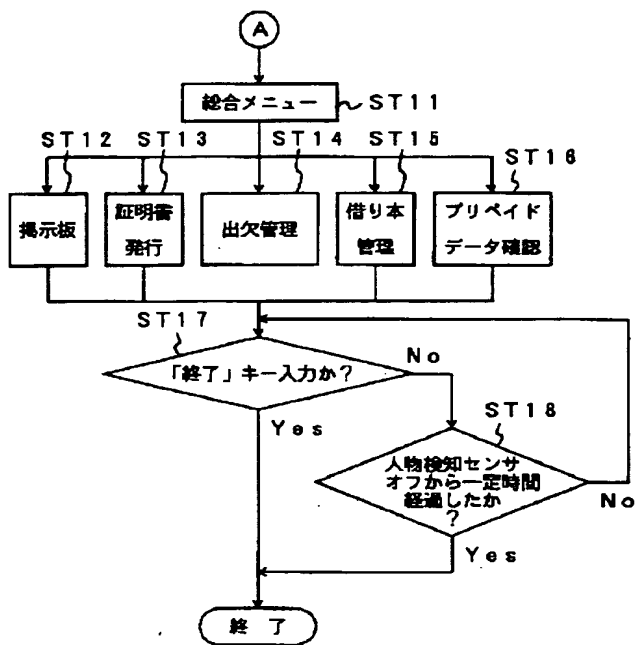
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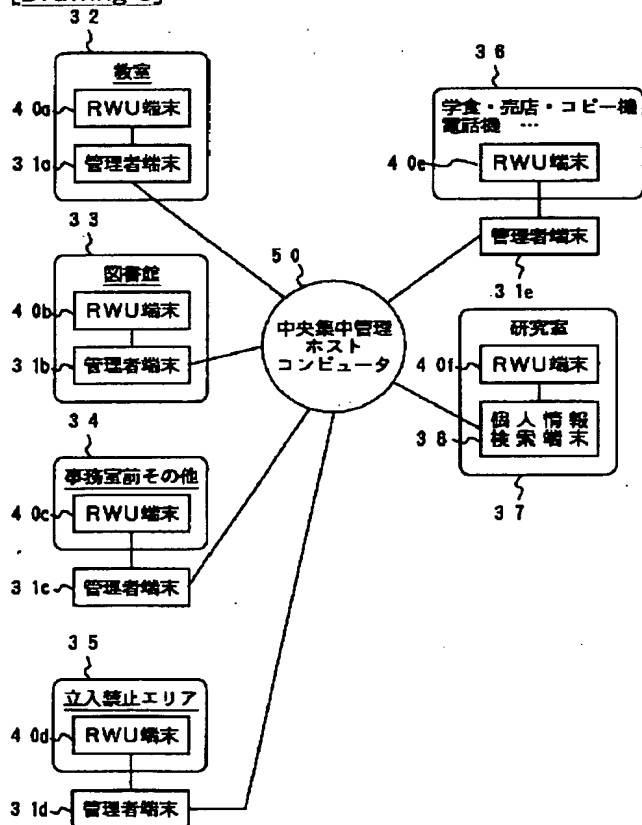
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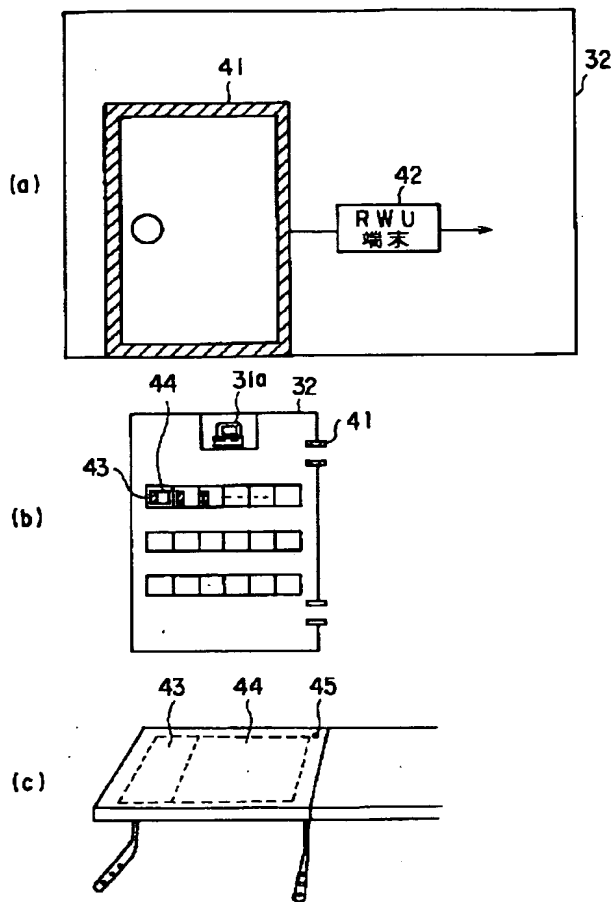
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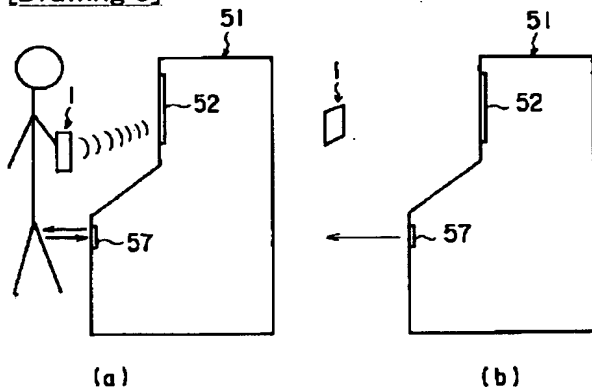
[Drawing 3]



[Drawing 4]



[Drawing 8]



[Drawing 9]

60 53 61

62

学籍番号、クラス、出席番号
氏名

63

時限 (時間)	科目名	教室	講義状況	出欠状況

現在の日付時刻

事務室からの連絡の有無 64

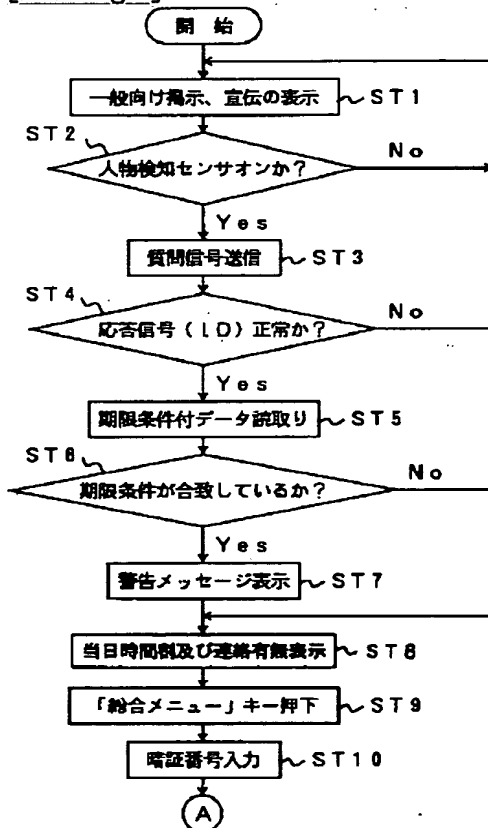
[Drawing 23]

A D

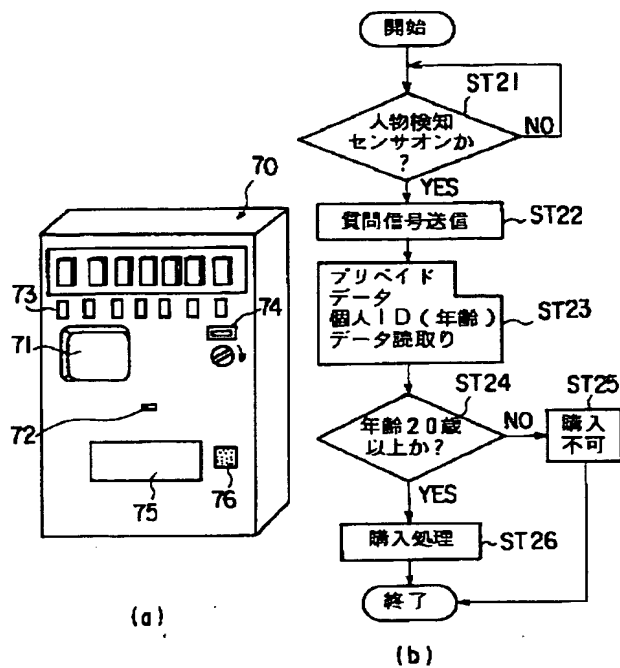
机のアドレス	個人ID情報
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12

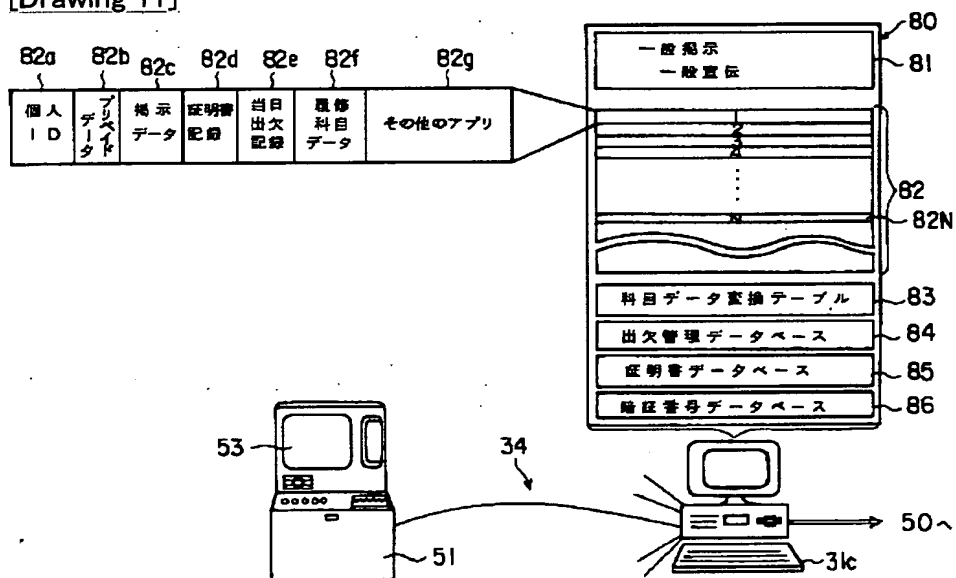
[Drawing 6]



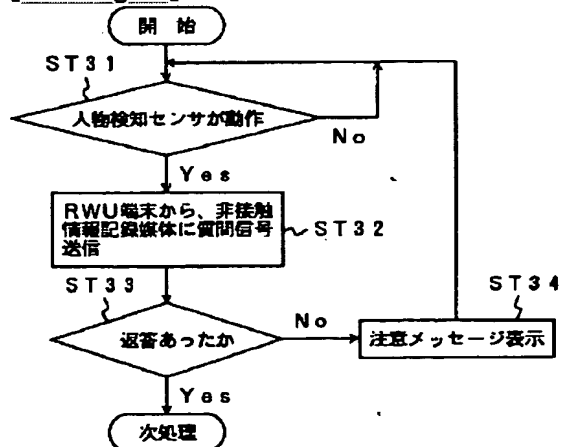
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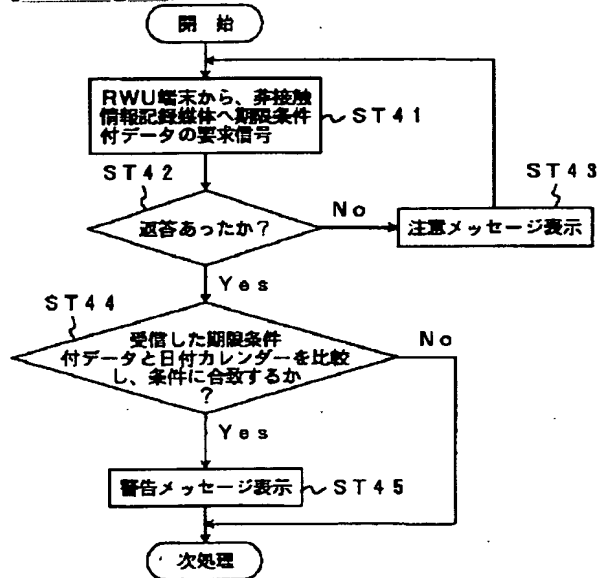
[Drawing 11]



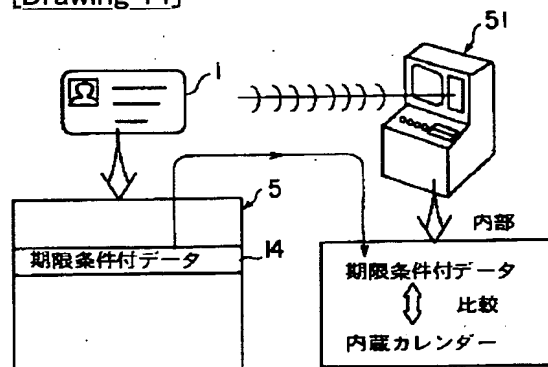
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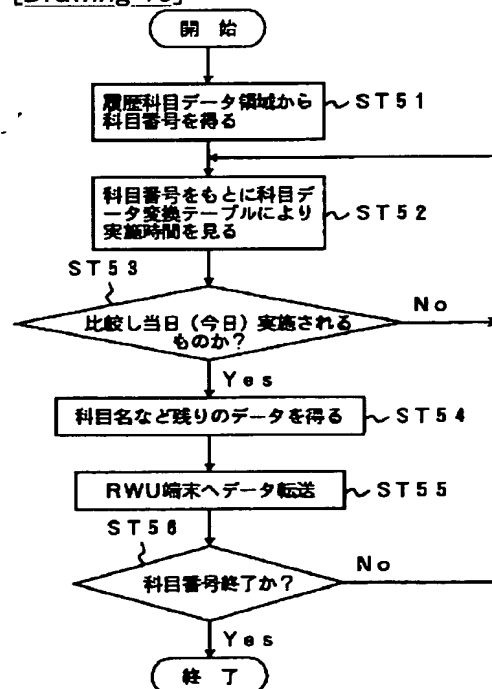
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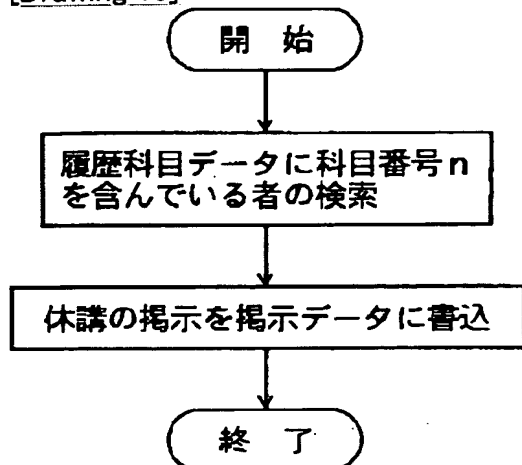
[Drawing 14]



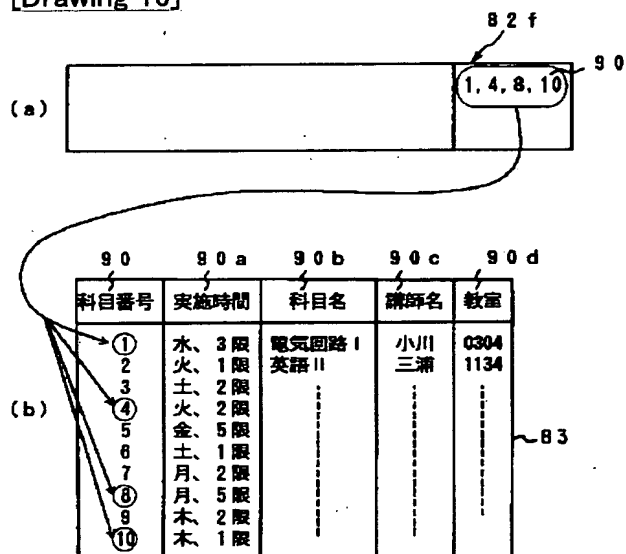
[Drawing 15]



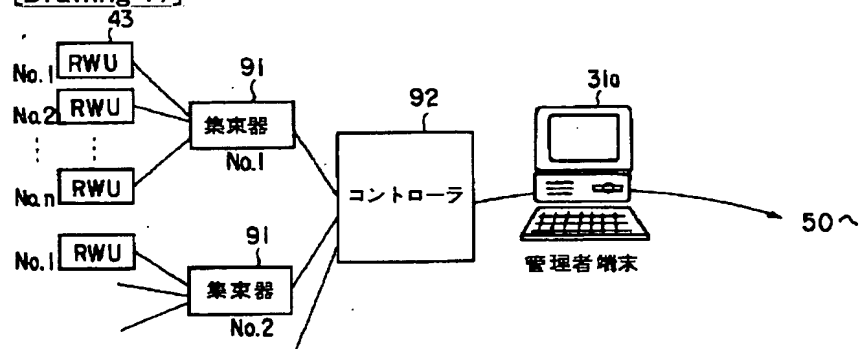
[Drawing 18]



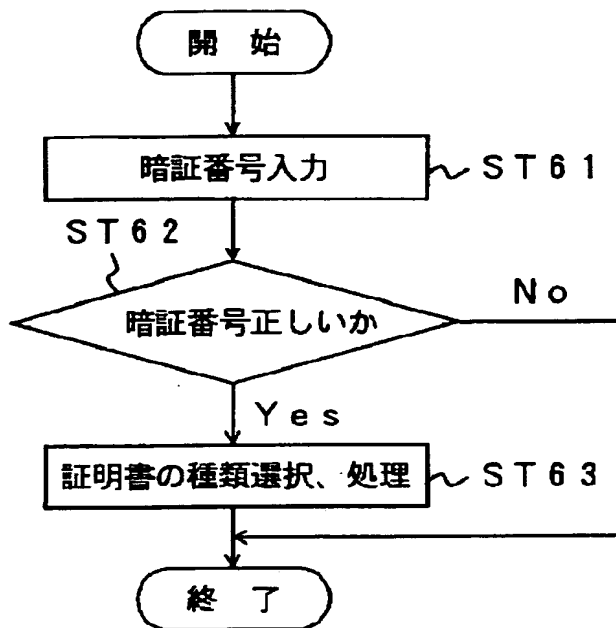
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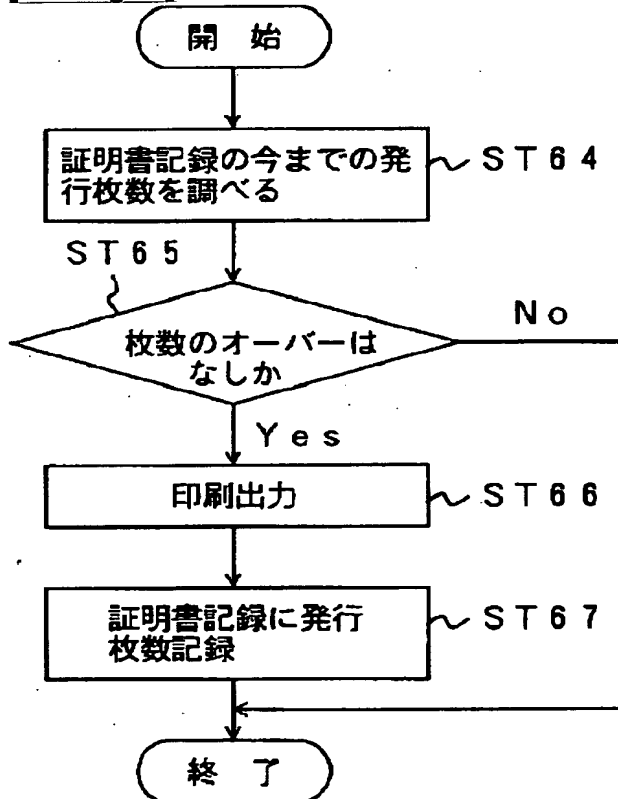
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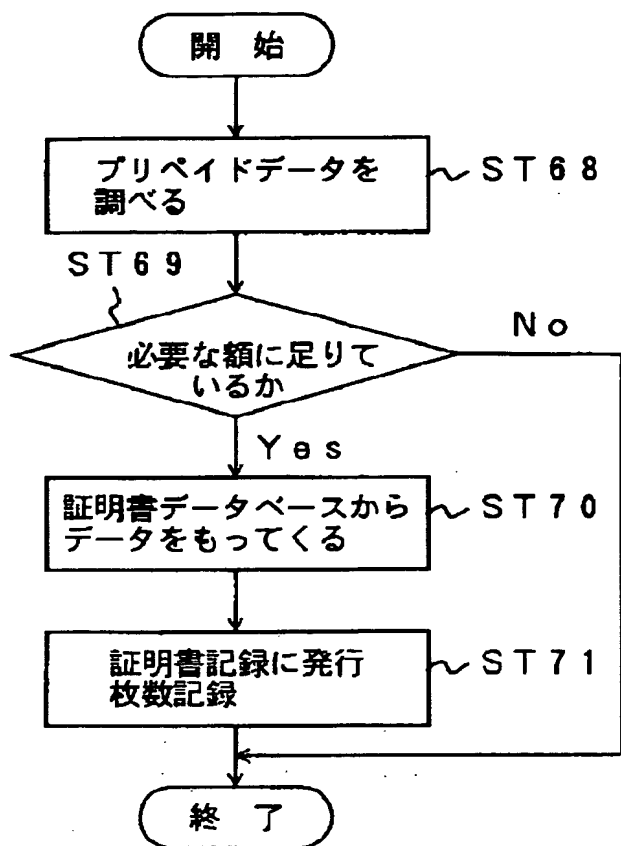
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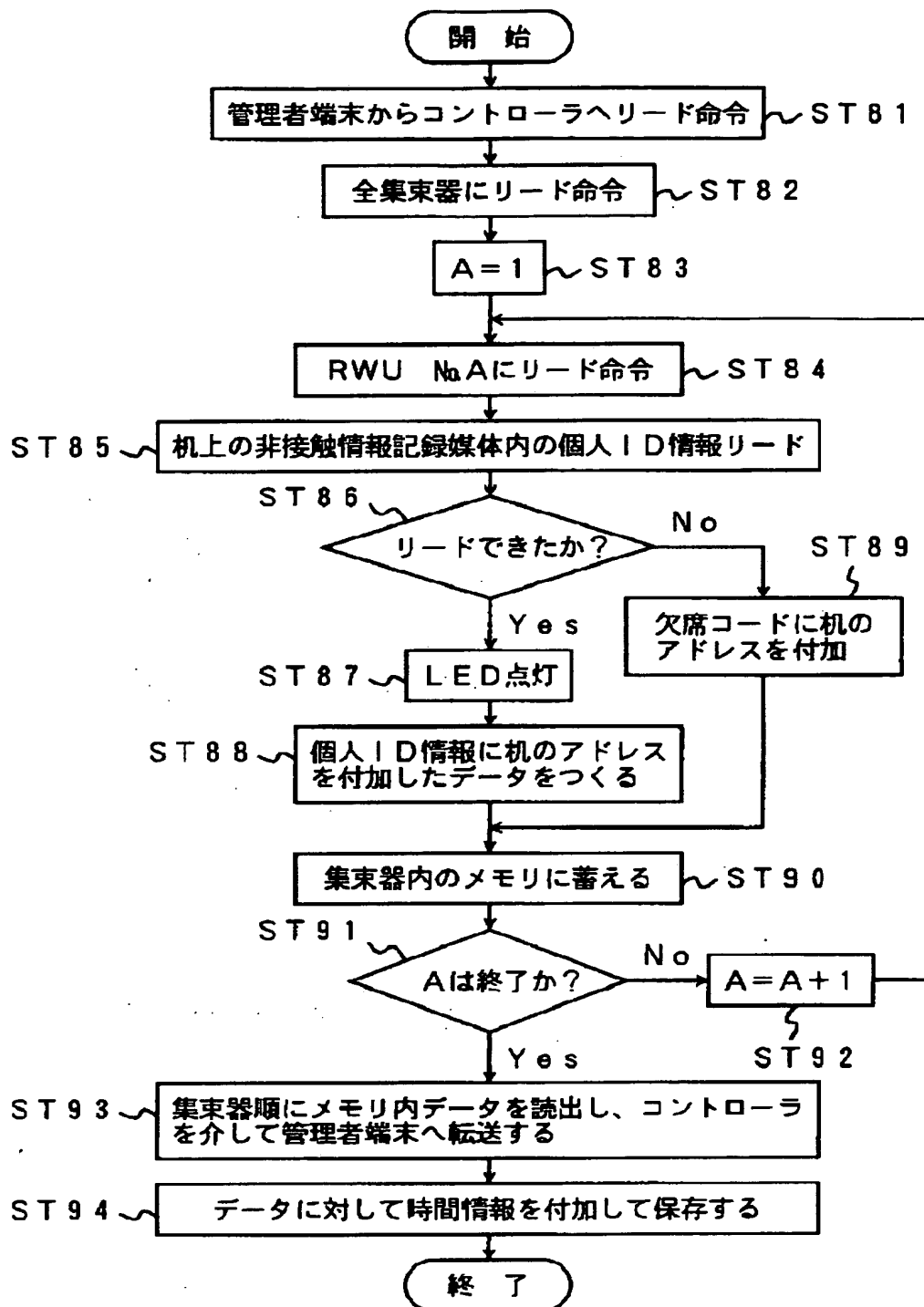
[Drawing 20]



[Drawing 21]



[Drawing 22]



[Translation done.]

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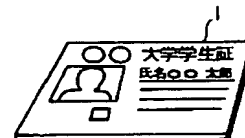
(54) 【発明の名称】 非接触情報記録システム

(57) 【要約】

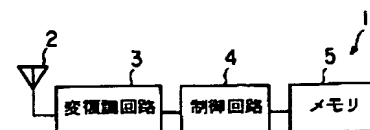
【課題】 管理者側にとっては事務作業の大幅な効率化を図ることができ、利用者にとっても迅速に自分が必要とする情報や書類を得る。

【解決手段】 学生証としての非接触情報記録媒体1は、アンテナ2、変復調回路3、制御回路4、及びメモリ5とから構成され、メモリ5にメモリアドレス11、個人ID情報12、プリペイドデータ13、期限条件付データ14、入退室時間一時記憶15等の情報を記憶し、非接触情報記録端末と非接触で情報を読み書きする非接触情報記録システムを構成する。

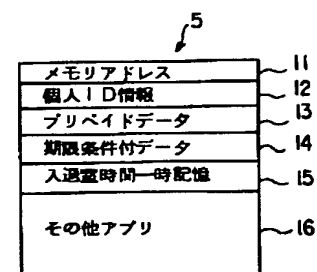
(a)



(b)



(c)



【特許請求の範囲】

【請求項 1】 学生証としての記載事項、課金情報等の各種情報を記憶する記憶手段と、

この記憶手段に記憶される情報を制御する制御手段と、
この制御手段で制御される情報を非接触で通信する通信手段と、

を具備したことを特徴とする非接触情報記録媒体。

【請求項 2】 全学生の情報を記憶しているホストコンピュータとネットワークを介して情報の通信を行う第 1 の通信手段と、

この第 1 の通信手段で通信される情報を制御する制御手段と、

この制御手段で制御される情報を非接触で通信する第 2 の通信手段と、

この第 2 の通信手段で通信する情報、または上記第 1 の通信手段で通信する情報を表示する表示手段と、
を具備したことを特徴とする非接触情報記録装置。

【請求項 3】 非接触情報記録媒体に記録されている検索情報を非接触で読出す読出手段と、

この読出手段で読出した検索情報に対応する情報を表示出力する表示出力手段と、

この表示出力手段で表示出力された情報を必要に応じて上記非接触情報記録媒体に非接触で記録する記録手段と、

を具備したことを特徴とする非接触情報記録装置。

【請求項 4】 非接触情報記録媒体に記録されている検索情報を非接触で読出す読出手段と、

この読出手段で読出した検索情報に基づいて必要とする書類を印刷出力する印刷手段と、

を具備したことを特徴とする非接触情報記録装置。

【請求項 5】 各種情報が記録されている非接触情報記録媒体に非接触で情報の読出し、書込みを行う非接触情報記録装置において、

上記非接触情報記録媒体に記録されている情報を時間により変更する変更手段を具備したことを特徴とする非接触情報記録装置。

【請求項 6】 図書館の本などの期限付きの借り物の期限データを記録している非接触情報記録媒体に非接触で読出し、書込みを行う非接触情報記録装置において、

上記非接触情報記録媒体に記録されている期限データを非接触で読出す読出手段と、

この読出手段で読出した期限データと予め内蔵している日付データとを比較する比較手段と、

この比較手段の結果に応じて警告を表示する表示手段と、

を具備したことを特徴とする非接触情報記録装置。

【請求項 7】 利用者の存在を検知する検知手段と、
この検知手段で利用者を検知した際、上記利用者が保持している非接触情報記録媒体に記録された検索情報を非接触で読出す読出手段と、

この読出手段で読出した検索情報に基づいて必要な情報を表示、または出力する表示出力手段と、

を具備したことを特徴とする非接触情報記録装置。

【請求項 8】 一定時間間隔で非接触情報記録媒体に質問信号を非接触で出力する出力手段と、

この出力手段で出力された質問信号に上記非接触情報記録媒体が反応している間のみ、上記非接触情報記録媒体を所持している所持者に必要な情報を表示、または出力する表示出力手段と、

を具備したことを特徴とする非接触情報記録装置。

【請求項 9】 利用者が所持し、非接触で情報が記録される非接触情報記録媒体と、

各部屋の出入口に設けられ、上記非接触情報記録媒体と非接触で情報の読取り、書込みを行うことによって上記非接触情報記録媒体を所持する利用者の入退室情報を読取る非接触情報記録手段と、

この非接触情報記録手段で読取った入退室情報によりリアルタイムで上記各部屋の状態を把握するホストコンピュータと、

を具備したことを特徴とする非接触情報記録システム。

【請求項 10】 所有者が所持する非接触情報記録媒体に記録されている所有者の識別情報、年齢情報、及びプリペイド情報を非接触で読出し、書込みを行う非接触情報記録手段と、

この非接触情報記録手段で読出した識別情報、年齢情報、プリペイド情報に応じて上記所有者の購入を制限する制限手段と、

を具備したことを特徴とする自動販売機。

【発明の詳細な説明】**【0001】**

【発明の属する技術分野】 この発明は、非接触情報記録媒体と非接触情報記録端末とから構成され、非接触で情報の読み書きを行う非接触情報記録システムに関する。

【0002】

【従来の技術】 従来の学生証は紙やプラスチックのカード上に学生の写真が貼られ、個人 ID 情報が印刷されているだけのものであった。学生は、必要なときに学校の管理者にこれを提示して試験を受けたり、証明書の発行をしてもらったり、あるいは図書館で本を借りたりしていた。

【0003】 また、学校（特に大学）における連絡掲示板は、休講の連絡、レポート提出の連絡、試験を行う連絡、個人に対する呼び出し等が同じような場所にまとめて掲示してあることが多かった。一方、学生の出欠管理は、出欠票などの紙を使用したものが一般的で、管理者（教員）は、提出された出欠票と名簿とを照らし合わせる対応作業に手間をとっていた。

【0004】 従来の学生証の場合、学校側の職員（管理人）が学生証を直接目で見て、その所有者が本人かどうかを確認しなくてはならなかった。また、確実に確認を

するには、学生証の大きさが小さいため、これを直接手にとって確認を行わなくてはならなかった。これは学生にとっても学校側の職員（管理人）にとっても面倒なものであった。また、提示された学生証の内容または確認内容をデータベース化することが難しく、職員があらためて端末に入力しなくてはならず、手間がかかった。

【0005】また、従来の連絡掲示板は1カ所にまとめられていて膨大な量の掲示があり、自分に必要な情報は何か、また、本当に必要な情報かを見て確認するのは手間がかかるものであった。特に試験期間前の掲示板前は大変混雑しており、自分に必要な情報を得るのに時間がかかっていた。そのため、個人に対する連絡や休講の連絡などを見落とすことも多かった。

【0006】また、出欠管理においては管理者が回収された出欠票等により、学生の出欠を確認してデータベース化するといった作業を行っており、多大な時間が費やされた。

【0007】

【発明が解決しようとする課題】上記したように、管理者（学校職員）側にとっては事務作業に対して非常に時間と手間がかかり、利用者（学生側）にとっても必要とする情報や書類を迅速に得られないという問題があった。

【0008】そこで、この発明は、管理者側にとっては事務作業の大幅な効率化を図ることができ、利用者にとっても迅速に自分が必要とする情報や書類を得ることのできる非接触情報記録システムを提供することを目的とする。

【0009】

【課題を解決するための手段】この発明の非接触情報記録媒体は、学生証としての記載事項、課金情報等の各種情報を記憶する記憶手段と、この記憶手段に記憶される情報を制御する制御手段と、この制御手段で制御される情報を非接触で通信する通信手段とから構成されている。

【0010】この発明の非接触情報記録装置は、全学生の情報を記憶しているホストコンピュータとネットワークを介して情報の通信を行う第1の通信手段と、この第1の通信手段で通信される情報を制御する制御手段と、この制御手段で制御される情報を非接触で通信する第2の通信手段と、この第2の通信手段で通信する情報、または上記第1の通信手段で通信する情報を表示する表示手段とから構成されている。

【0011】この発明の非接触情報記録装置は、非接触情報記録媒体に記録されている検索情報を非接触で読出す読出手段と、この読出手段で読出した検索情報に対応する情報を表示出力する表示出力手段と、この表示出力手段で表示出力された情報を必要に応じて上記非接触情報記録媒体に非接触で記録する記録手段とから構成されている。

【0012】この発明の非接触情報記録装置は、非接触情報記録媒体に記録されている検索情報を非接触で読出す読出手段と、この読出手段で読出した検索情報に基づいて必要とする書類を印刷出力する印刷手段とから構成されている。

【0013】この発明の非接触情報記録装置は、各種情報が記録されている非接触情報記録媒体に非接触で情報の読出し、書込みを行う非接触情報記録装置において、上記非接触情報記録媒体に記録されている情報を時間により変更する変更手段から構成されている。

【0014】この発明の非接触情報記録装置は、図書館の本などの期限付きの借り物の期限データを記録している非接触情報記録媒体に非接触で読出し、書込みを行う非接触情報記録装置において、上記非接触情報記録媒体に記録されている期限データを非接触で読出す読出手段と、この読出手段で読出した期限データと予め内蔵している日付データとを比較する比較手段と、この比較手段の結果に応じて警告を表示する表示手段とから構成されている。

【0015】この発明の非接触情報記録装置は、利用者の存在を検知する検知手段と、この検知手段で利用者を検知した際、上記利用者が保持している非接触情報記録媒体に記録された検索情報を非接触で読出す読出手段と、この読出手段で読出した検索情報に基づいて必要な情報を表示、または出力する表示出力手段とから構成されている。

【0016】この発明の非接触情報記録装置は、一定時間間隔で非接触情報記録媒体に質問信号を非接触で出力する出力手段と、この出力手段で出力された質問信号に上記非接触情報記録媒体が反応している間のみ、上記非接触情報記録媒体を所持している所持者に必要な情報を表示、または出力する表示出力手段とから構成されている。

【0017】この発明の非接触情報記録システムは、利用者が所持し、非接触で情報が記録される非接触情報記録媒体と、各部屋の出入口に設けられ、上記非接触情報記録媒体と非接触で情報の読取り、書込みを行うことによって上記非接触情報記録媒体を所持する利用者の入退室情報を読取る非接触情報記録手段と、この非接触情報記録手段で読取った入退室情報によりリアルタイムで上記各部屋の状態を把握するホストコンピュータとから構成されている。

【0018】この発明の自動販売機は、所有者が所持する非接触情報記録媒体に記録されている所有者の識別情報、年齢情報、及びプリペイド情報を非接触で読出し、書込みを行う非接触情報記録手段と、この非接触情報記録手段で読出した識別情報、年齢情報、プリペイド情報に応じて上記所有者の購入を制限する制限手段とから構成されている。

【0019】

【発明の実施の形態】以下、この発明の一実施の形態について図面を参照して説明する。図1は、この発明に使用する非接触情報記録媒体1の概要を示す。学生は、図1の(a)に外観を示す非接触情報記録媒体1を学生証として所有する。図1の(b)に示すように非接触情報記録媒体1は、アンテナ2、変復調回路3、制御回路4、及びメモリ5とから構成されている。図1の(c)に示すようにメモリ5に記憶されるメモリマップは、メモリアドレス11、個人ID情報12、プリペイドデータ13、期限条件付データ14、入退室時間一時記憶15、及びその他16となっている。

【0020】図2は、この発明に係る非接触情報記録媒体1の情報を読み書きする機能を含む非接触情報記録端末(装置)20を示すものである。この非接触情報記録端末20の機能を含む端末(装置)を学内に配置・設置する。

【0021】図2の(a)に示すように非接触情報記録端末20は、非接触情報記録媒体1への送受信部21、各種情報を表示する表示部22、及び操作部23とから構成されている。

【0022】図2の(b)に示すように非接触情報記録端末20の回路構成は、アンテナ24、…と送受信回路25とから構成されている。送受信回路25は全体を制御する制御回路26を有している。制御回路26は、変調回路27を用いてアンテナ24を介して非接触情報記録媒体1に送信し、復調回路28を用いてアンテナ24を介して非接触情報記録媒体1からの電波を受信する。また、制御回路26には、データを記憶するメモリ29、ネットワーク30を介して管理者端末31、…が接続されている。

【0023】図3は、非接触情報記録媒体1と非接触情報記録端末20を用いた全体的なシステムの概念図を示すものである。まず、学内における教室32では、管理者端末31aとRWU端末40aとが設けられネットワークを介して中央集中管理ホストコンピュータ50に接続され、学生の出欠管理が行われる。RWU(Reader Writer Unit)端末40aとは、非接触情報記録端末20の機能を含む端末(装置)のことである。

【0024】図書館33には、管理者端末31bとRWU端末40bとが設けられネットワークを介して中央集中管理ホストコンピュータ50に接続され、入退館管理や本の貸し出し管理が行われる。

【0025】事務室前その他34では、事務室前その他にRWU端末40cが設けられ、事務室内に管理者端末31cが設けられネットワークを介して中央集中管理ホストコンピュータ50に接続され、おもに個人向けの電子掲示板を見ることができる。

【0026】立入禁止エリア35では、エリア内にRWU端末40dが設けられ、管理者端末31dによってネ

ットワークを介して中央集中管理ホストコンピュータ50に接続され、セキュリティ管理が行われる。

【0027】学生食堂、売店、コピー機、電話機等36では、管理者端末31eとRWU端末40eとが設けられネットワークを介して中央集中管理ホストコンピュータ50に接続され、学生食堂など有料施設で非接触情報記録媒体1の学生証をプリペイドカードとして使うことができる。

【0028】研究室等37では、RWU端末40fと個人情報検索端末38が設けられネットワークを介して中央集中管理ホストコンピュータ50に接続され、離れたところから個人的な情報が検索できる。

【0029】以下にそれぞれの場所におけるシステムについて、より詳細な説明をする。図4は、学生が授業を受ける教室32におけるシステムを示すものである。すなわち、図4の(a)に示すように教室32の出入口の(例えば)ドア受けのまわりにアンテナ41を設置したRWU端末42をとりつける。これにより学生の出欠管理を行う。図4の(b)に示すように教室32内の教壇には、このRWU端末42と接続されている管理者用端末31aを設置する。この管理者用端末31aは、管理者(教職員)のみが使うことを許されており、教室にいる者の情報などがディスプレイなどの出力デバイスにリアルタイムに出力できる。また、出席とする有効な時間設定も行える。

【0030】また、図4の(c)に示すように受講者の機の上面または下面にRWU(端末)43とアンテナ44を取り付け、管理者端末31aで管理することによってどの机にどの学生が座っているかの位置把握も可能となる。また、机の上には出欠確認等に用いられるLED(発光ダイオード)45が設けられている。

【0031】図書館33では、学生が授業を受ける教室32で行う出欠管理と同様なシステムで入退館を管理するシステムや、非接触情報記録端末20の機能を有する端末を設置し、非接触情報記録媒体1である学生証と管理者端末31bの両方に貸し出す本のデータを書き込むことにより、本の貸し出し・返却管理を行う。

【0032】図5は、掲示板などを表示する総合的なRWU端末(装置)51を示す。これは、事務室前、中央キャンパス等、学生がよく足を運ぶ、もしくは登下校の際によく通る場所34に設置する。構成としては、非接触情報記録媒体1である学生証内のデータを読み書きする信号を送受するRW-ANT(リーダ・ライタアンテナ)52、表示手段としてのディスプレイ53、証明書が取り出せる印刷手段としてのプリンタ54、音声ガイドスピーカ55、入力キー56、赤外線など人物が非接触情報記録端末51の前に立ったか検知する人物検知センサ57などからなる。

【0033】次に、このような構成においてRWU端末51における処理動作を図6、図7のフローチャートを

参照して説明する。まず、処理は、初期状態（誰も利用していない状態の時）にディスプレイ53上に学生一般に向けた掲示や宣伝を表示しておく（ST1）。

【0034】ここで、図8に示すように人物検知センサ57（これは赤外線センサ等が考えられる）の働きを示す。図8の（a）に示すように人物がちょうど真正面の一定距離以内に立ったときだけ、RWU端末51を動作させる。したがって、図8の（b）に示すように非接触情報記録媒体1だけが存在していても、RWU端末51は動作を開始しない。これは、誤動作防止、および真正面に立たないと操作できないということで他人からののぞき込み防止等、プライバシーの保護ができる。

【0035】この人物検知センサ57が反応をすると、RW-ANT52から非接触情報記録媒体（学生証）1内の回路を立ちあげるような信号（質問信号）が送信される（ST3）。このとき、非接触情報記録媒体1が反応をすると、この非接触情報記録媒体1からRW-ANT52に個人ID情報12を含む信号が送り返される。

【0036】なお、RWU-ANT52は、学生証の所有者が非接触情報記録媒体（学生証）1を導電性がある入れ物以外の入れ物に入れておき、かつ、胸ポケットや体の前面のポケットに入れておけば検知可能なように設計されている。しかしながら、非接触情報記録媒体（学生証）1からの反応が返ってこない場合は、非接触情報記録媒体（学生証）1を持っていないか、非接触情報記録媒体（学生証）1が導電性のある物体に近接していることが考えられるので、「学生証をアンテナの前にかざして下さい」等のメッセージをディスプレイ53に表示する。

【0037】RWU端末51に受信された情報はチェックされ、学生証所有者が正式な学生と認識される（ST4）と、続いてRWU端末51は、非接触情報記録媒体（学生証）1から期限条件付きデータ14を読み出す（ST5）。

【0038】もし、その期限条件付きデータの条件が満たされているならば（ST6）、警告メッセージを表示する（ST7）。例えば、10月13日の処理で、非接触情報記録媒体1のメモリ5における期限条件付データ14に「10月13日まで有効の〇〇の本を借りた」という情報があつたならば、このデータがRWU端末51に読み出され、「今日は〇〇の本の返却日です」とメッセージがディスプレイ53に表示される。

【0039】図9は、ディスプレイ53に表示されたメイン画面60を示す。メイン画面60は、現在の日付・時間61、氏名などのID62、当日の時間割63、事務室からの連絡の有無64等を表示する（ST8）。予めそのIDの学生の履修科目は中央集中管理ホストコンピュータ50に登録されており、その日の時間割63は中央集中管理ホストコンピュータ50内のデータベースを検索することにより表示される。

【0040】時間割63には、時限（講義時間帯）、科目名、講義の教室のほかに、講義が終了したか、講義中であるか、まだ行われていないかを示す講義状況、出欠がチェックされているかを示す出欠状態が表示される。

【0041】講義状況は、各教室32に配置されたRWU端末42、及び管理者用端末31aにより管理される。例えば、講師（管理者）自身が非接触情報記録媒体1を持ち、講義を行う教室にあるRWU端末42のチェックをまだ受けていないときは「まだ行われていない」、「入」っておりまだ「出」ていない場合は「講義中」、「入」「出」両方チェックされている場合は「終了」などとする。この講義状況は、各教室に配置された出欠管理用の管理者端末31aから、掲示板、時間割などのサービスを行うRWU端末51を管理する管理者端末31cに、ネットワークを通じてリアルタイムで伝達している。出欠状態は同様に図4のシステムで管理されるものである。

【0042】総合メニューは、学生が事務室連絡を見るなど他のサービスを利用しようとするときにキー入力されるものである。「総合メニュー」キーが押下される（ST9）とRWU端末51は、暗証番号入力を促して（ST10）正しい番号が入力されると総合メニューが利用可能となる（ST11）。

【0043】総合メニューには、掲示板（事務室からの連絡）（ST12）、証明書発行（ST13）、出欠確認（ST14）、借りている本の確認（ST15）、プリペイドデータ確認（ST16）などの項目がある。

【0044】この中で、ステップST12の「掲示板」を選ぶと、従来、事務室前の掲示板に掲示が行われていた個人に対する呼び出しや連絡事項、講義やゼミ受講者に対する時間割変更、休講、レポート、テスト等の通知が行える。講義・ゼミ等個人以外に対する掲示は、中央集中管理ホストコンピュータ50に登録されているその人の履修科目からその科目を履修している学生が検索され、自動的に通知が行われる。

【0045】ステップST13の「証明書発行」は、学生割引証明書や在学・成績証明書その他、各種証明書を発行しようというものである。ステップST14の「出欠確認」は、過去数週間にわたる出欠履歴確認を行う。ステップST16の「プリペイドデータの確認」は、残金（残り度数）を確認することができる。

【0046】非接触情報記録媒体（学生証）1の所有者が、これらのサービスを終了させるとき、正規におこなうには「終了」ボタンを押す（ST17）等の処理を行うが、正式な終了の手続きを行わずに端末の前から去ったときでも、センサ57により一定時間後に終了するようになっている（ST18）。また、これらの処理は、ディスプレイ53などの視覚的な出力装置によるものと同時に音声によるガイド55も行うようになっている。

【0047】次に、立ち入り禁止エリア35や人の通行

量調査エリアでは、システムが非接触であることを利用して、壁内や天井内（裏側）など見えないところに非接触情報記録端末20を設置しておき、非接触情報記録媒体1を持った者がここを通った時にその者の個人ID情報12を記録しておくものである。

【0048】学食や売店など学内の有料のサービス36には、非接触情報記録媒体1をプリペイドカードとして用いる。この非接触情報記録媒体1が従来のプリペイドカードと異なる点は、従来のものは所持金（度数）が0になると使用不可能となるが、この非接触情報記録媒体1は現金とひきかえに所持金（度数）をメモリ5内のプリペイドデータ13に書き込むことができる。これによって、学生証としての非接触情報記録媒体1がプリペイドカードとしても使用可能となる。

【0049】図10は、非接触情報記録媒体1の特徴を活かして自動販売機に応用した例を示すものである。図10の（a）に示すようにタバコの自動販売機70とした場合について説明する。タバコの自動販売機70には、非接触情報記録媒体1である学生証内のデータを読み書きする信号を送受するアンテナ71、赤外線など人物が自動販売機70の前に立ったか検知する人物検知センサ72、タバコの選択キー73、コイン投入口74、タバコの取出口75、及び釣り銭取出口76とから構成されている。

【0050】図10の（b）に示すフローチャートを参照して動作を説明する。すなわち、タバコの自動販売機70の人物検知センサ72が人物を検知した際（ST21）、アンテナ71から非接触情報記録媒体（学生証）1内の回路を立ち上げるような信号（質問信号）が送信される（ST22）。

【0051】このとき、非接触情報記録媒体1が反応をするとこの非接触情報記録媒体1からアンテナ71に、プリペイドデータ13、個人ID情報12を含む信号が送り返され、このデータを読取る（ST23）。続いて、この読取った個人ID情報12より、年齢条件によって購入可能、不可能の場合分けをする（ST24）。例えば、年齢が20歳未満の場合に購入不可とする（ST25）。

【0052】年齢が20歳以上ならば、読取ったプリペイドデータ13に基づいて購入処理を行って終了する（ST26）。一般学生が集まる校舎から離れた研究室37から、事務室その他34の場所に設置するRWU端末51と同等のサービスを受けるために、中央集中管理ホストコンピュータ50とネットワークを組んでいる。これによって、研究室など離れた場所37でも既設または新設の端末により中央集中管理ホストコンピュータ50その他に記録されている個人的なデータを取り出すことが可能となる。

【0053】学内の各場所32～37にはRWU端末40a～40fと管理者端末31a～31eがその場所内

かその場所外で接続されており、各管理者端末31はその場所の部分的な情報・ネットワークの管理を行っている。全体として、学内における非接触情報記録媒体1をもちいた各サービスは中央集中管理ホストコンピュータ50により、総合的なネットワークおよび情報管理を行っている。

【0054】図11は、事務室前など34に設置する図5で示したRWU端末51とその管理者端末31cの関係を示したものである。管理者端末31c内のメモリまたは補助記憶装置などの記憶装置80には、一般向けに行う掲示や宣伝等の記録部分81、および個人ID82a、プリペイドデータ82b、掲示データ82cなどが記憶されている個人データ格納エリア82などがある。例えば、学籍番号順に個人的なデータが格納されるのならば、N番目の学籍番号の人はN番目のエリア82Nに格納されていることになる。

【0055】個人データ1人分の中は個人ID82a、プリペイドデータ82b、掲示データ82c、証明書記録82d、当日出欠記録82e、履修科目データ82f、及びその他のアプリケーション82gのようになっている。

【0056】管理者端末31c内の記憶装置80にはそのほかに、科目データ変換テーブル83、出欠管理データベース84、証明書データベース85、暗証番号データベース86などが格納されている。

【0057】RWU端末51は管理者端末31cに接続されており、さらに管理者端末31cは中央集中管理ホストコンピュータ50に接続されている。RWU端末51の主な管理は管理者端末31cによって行われる。

【0058】初期状態（誰も利用していない状態）の時に、RWU端末51は、管理者端末31c内の記憶装置80に記憶されている学生一般に向けた掲示や宣伝等の記録部分81のデータをネットワークを通じて読み出し、RWU端末51のディスプレイ53上に表示をする（ステップST1に対応する）。

【0059】次に、最初にRWU端末51が非接触情報記録媒体1を所持した学生を認識する動作を図12のフローチャートを参照して説明する。まず、RWU端末51の人物検知センサ57が反応したかチェックされ（ST31）、人物が検知されるとRWU端末51のアンテナ52から非接触情報記録媒体1内の回路を立ち上げる質問信号が送信される（ST32）。非接触情報記録媒体1はアンテナ2によってこの質問信号を受信し、メモリ5内部に保存してある個人ID情報12のデータをRWU端末51に向かって送信し、RWU端末51はアンテナ52で受信してデータを得る（ST33）。

【0060】もし、RWU端末51が質問信号を送信しても返答がない場合は、非接触情報記録媒体（学生証）1を持っていないか、電波が届かないところにあることが考えられるため、この場合は「学生証をアンテナ前に

かざしてください」等の注意メッセージをディスプレイ53上に表示する(ST34)。

【0061】次に、非接触情報記録媒体1内の期限条件付きデータ14の処理動作を図13のフローチャートを参照して説明する。また、その時の処理動作のイメージを図14に示す。

【0062】まず、RWU端末51は、非接触情報記録媒体1に期限条件付きデータ14を要求する信号を送信する(ST41)。非接触情報記録媒体1がこれにตอบสนองして期限条件付きデータ14をRWU端末51に向かって送信し、RWU端末51がこれを受信をする。もし、RWU端末51が要求信号を送信しても返答がない場合は、注意メッセージをディスプレイ53上に表示する(ST43)。

【0063】RWU端末51は、受信した期限条件付きデータ14と予め内蔵している日付カレンダーとを比較して期限条件付きデータ14が当日か、期限切れであるか等を判断し(ST44)、条件に合致した場合は警告のメッセージを表示する(ST45)。

【0064】次に、時間割管理について図15のフローチャートを参照して説明する。まず、図16は、図9に示したメインの時間割画面における当日の時間割が表示される機構を示すものである。

【0065】すなわち、管理者端末31cの個人データ格納エリア82における履修科目データ82fにはその人の履修科目の科目番号90が記憶されており、これを得る(ST51)。管理者端末31cは、得られた科目番号90から科目データ変換テーブル83を用いて履修科目の実施時間90aを見る(ST52)。

【0066】管理者端末31cは、この実施時間90aと内蔵のカレンダーとを比較し、当日(今日)実施される科目かどうかを判断し(ST53)、実施されるものならば、科目データ変換テーブル83から科目名90bなどの残りのデータを得て(ST54)、RWU端末51へデータ転送する(ST55)。科目番号が終了するまで行われる(ST56)。

【0067】図17は、講義における出欠状態を管理するシステムを示すものである。このシステム構成は、図4で説明した各機に設けられたRWU43、…が集束器91、…とコントローラ92を介して管理者端末31aに接続されている。そして管理者端末31aからは中央集中管理ホストコンピュータ50に接続されている。

【0068】当日の出欠状態については個人データ格納エリア82の当日出欠記録82eに格納されている出欠データを読み出して表示する。これとは他に、出欠データは出欠管理データベース84にも記録される。この出欠管理データベース84は過去の出欠状態もすべて記録してある。

【0069】また、図9に示した表示画面60における事務室からの連絡の有無64は、非接触情報記録媒体1

の所有者個人に対する連絡・掲示があるかどうかを知らせるためのものである。個人に対する連絡・掲示は管理者端末31cの個人データ格納エリア82内の掲示データ82c内にある。この中にデータがなければ連絡事項はないし、データが入っていれば連絡事項があることになる。

【0070】ステップST11における総合メニューは、学生が事務室連絡を見るなどの他のサービスを利用しようとするときにキー入力される。総合メニューに進むキーが押されると、RWU端末51は暗証番号入力を促し、正しい番号が入力されると、ステップST11の総合メニューが利用可能となる。

【0071】総合メニューには、ステップST12～16に示すように掲示板(事務室からの連絡)、証明書発行、出欠確認、借りている本の確認、プリペイドデータ確認などの項目がある。

【0072】この中で、ステップST12の掲示板を選ぶと、従来、事務室前の掲示板に手作業で掲示が行われていた個人に対する呼び出しや連絡事項、講義やゼミ受講者に対する時間割変更、休講、レポート、テスト等の通知が行える。

【0073】図11で示したとおり、連絡・掲示事項は管理者端末31c内の個人データ収納エリア82の掲示データ82cに格納される。掲示板が選ばれた場合、RWU端末51はこの各個人に対応する個人データ収納エリア82の掲示データ82cからデータを持ってきて表示する。

【0074】図18は、管理者が掲示板連絡をするときの通知例を示すものである。今、全くのその個人に対して連絡をしようとするときは管理者はその個人に対応する掲示データ82cに直接データを書き込めばよい。また、特定の講義・ゼミ等を履修している学生に対する休講等の連絡は、まずその科目番号を履修している学生を検索し、その学生の掲示データ82cのみに書き込みを行えばよい。すなわち、図18のフローチャートにおいて、科目番号nを履修している学生を検索して、検索された学生に対して休講の掲示板連絡をする。

【0075】次に、ステップST13における証明書発行は、学生割引証明書や在学・成績証明書その他、各種証明書を発行するものである。また、証明書は学生割引証明書のように1年間に発行される枚数が決まっている証明書や、成績証明書のように発行するのに有料のものなどがある。

【0076】基本的な証明書発行の動作を図19のフローチャートを参照して説明する。すなわち、暗証番号が入力され(ST61)、この暗証番号が正しければ(ST62)、証明書の種類が選択されて発行処理される(ST63)。

【0077】ステップST63において、枚数制限がある証明書の場合は、図20に示すフローチャートの動作

処理となる。すなわち、証明書記録82dにおける今までの発行枚数を調べ(ST64)、枚数のオーバー(超過)はなしか否かを調べ(ST65)、枚数のオーバーがない場合に印刷出力する(ST66)とともに、証明書記録82dに発行枚数を記録する(ST67)。

【0078】また、ステップST63において、有料証明書の場合は、図21に示すフローチャートの動作処理となる。すなわち、プリペイドデータ13を調べて(ST68)、必要な額に残高が足りている(ST69)場合に証明書データベース85からデータをもってきて発行する(ST70)とともに証明書記録82dに発行枚数を記録する(ST71)。

【0079】また、成績証明書等の場合、管理者端末31c内に証明書データベース85を用意しておき、そこからデータを引き出して印刷出力する。次に、ステップST14における出欠管理は、過去の自分の出欠がどのように管理されているかを見ることができる。出欠管理の方法は、各教室に配置されたRWU端末42及び43をその管理者端末31aからネットワークを通じて管理者端末31cの出欠管理データベース84内に記録される。出欠管理は、この出欠管理データベース84内からデータを引き出し、表示することで行われる。

【0080】次に、ステップST15における借り本管理に関するデータについては、図書館33にある管理者端末31bのデータベースにアクセスを行い、そこから図書館33の管理者端末31b→掲示板等を管理している管理者端末31c→RWU端末51とデータを持ってきて表示する。

【0081】次に、ステップST16におけるプリペイドデータ確認は、管理者端末31cの個人データ格納エリア82のプリペイドデータ82b内のデータをRWU端末51に持ってくることで見ることができ、自分の残高を確認できる。

【0082】次に、上述した図4、図17において、学生が授業を受ける教室32における出欠管理システムの構成について詳細に説明する。教室32の学生(聴講生)用の各機の表面または裏面または机板の内部にRWU43とアンテナ44とを設置し、机の表には確認用のLED45が設けられている。また教壇等、管理者が操作しやすい場所に管理者端末31aが設置されている。

【0083】各RWU43は一定の個数ごと(例えば机の列ごと)に集束器91に接続されている。また、集束器91、…には最終的な集束器であるコントローラ92に接続され、コントローラ92は管理者端末31aに接続されている。

【0084】各アンテナ44は隣の機のアンテナと干渉のないように設計されており、出欠をとるときには学生は各自の座っている机の上に自分の非接触情報記録媒体1である学生証を置いておく。また、「出席である」と確認された場合は机の上の確認用LED45が光ること

によって学生にも確認ができるようになっている。

【0085】管理者端末31aは管理者のみに使うことが許されており、教室にいるものの情報などがディスプレイなどの出力デバイスにリアルタイムまたは設定した時間毎に表示ができる。

【0086】図22のフローチャートを参照して管理者端末31aから出席をとる時の動作を説明する。なお、図23はここで扱うデータ形式Dを示すものである。まず、管理者端末31aからコントローラ92へリード命令が送られる(ST81)。続いてコントローラ92は、全部の集束器91に一斉にリード命令を出す(ST82)。これによって各集束器91はすべて同時に動作を始める。

【0087】集束器91の動作は、接続されているRWU43のNo1から順にリード命令を送り(ST84)、机の上にある非接触情報記録媒体1内の個人ID情報12をリードする(ST85)。このとき、正式にリードできた場合、机の上のLED45を点灯させ(ST87)、読みとった個人ID情報12にその機のアドレス(例えば、No. 1、No. 2、…)Aを付加したデータを集束器91内のメモリに蓄える(ST88、90)。

【0088】正式にリードできなかった場合(机の上に非接触情報記録媒体1がなかった場合)、個人ID情報12の代わりに欠席のコードを作り、これに機のアドレスを付加したものを集束器91内のメモリに蓄える(ST89、90)。この動作を集束器91、…に接続されているすべてのRWU43、…に対して行う(ST91、92)。

【0089】コントローラ92は、接続されている集束器91、…のNo1から順に、集束器91のメモリ内にあるデータを読み出し、そのまま管理者端末31aへ転送する(ST93)。管理者端末31aは、得られたデータに時間情報を付加したものを保存し(ST94)、処理を終了する。これによって何時に、どの机に誰が座っているかが管理者端末31a上で確認することができる。

【0090】以上説明したように上記発明の実施の形態によれば、学生証を非接触情報記録媒体とし、学内にRWU(Reader Writer Unit)端末を配置することによって、学内における各種サービスを行うものである。その中で、従来、事務室職員が行っていた掲示板はりだし、証明書発行等の業務をもRWU端末に持たせている。掲示板に限って言えば、これにより各個人が必要となる情報のみを表示したり、あらかじめ情報の選択を自動的に行ったり、従来の掲示板では行えなかった個人履修科目管理など、各種サービスが行える。また、掲示板以外にもRWU端末のネットワークを組むことによって、各教室における出欠管理、学食などにおけるプリペイド・サービスなど、学校におけるサービス

の大部分をカバーする非接触情報記録システムを構築することができる。この非接触情報記録システムを使用することにより、学生は非接触情報記録媒体である学生証1枚であらゆる学内生活を送ることが可能となる。

【0091】また、従来の学生証の内容と課金情報その他学校生活に必要とされるアプリケーション情報を非接触情報記録媒体に持たせることによって、従来、管理者（学校職員）側にとっては非常に時間と手間がかかった事務作業の大幅な効率化がおこなえ、利用者（学生側）にとっても迅速に自分が必要とする情報や書類を得ることができる。

【0092】学生が必要とする情報を主に掲示する電子掲示板においては、個人に必要な情報のみ、表示・出力させたり、証明書類を非接触でかつ必要とされる時に時間がかからずに発行を受けることが可能となる。

【0093】出欠を管理するシステムにおいては、従来のように管理者（教職員）が出席票を回収し、一人一人名簿などに記入するといった煩雑な作業が不要となり、教員の時間有効活用が期待できる。

【0094】非接触情報記録媒体内のメモリに課金情報エリアを設定することにより、従来のような使い捨てのプリペイド・カードとは違い、貯金通帳の感覚で何度でも補充したり使ったりが可能となる。また、非接触情報記録媒体内のメモリに記憶されている他の情報と組み合わせた応用的な使い方が可能となる。

【0095】

【発明の効果】以上詳述したようにこの発明によれば、管理者側にとっては事務作業の大幅な効率化を図ることができ、利用者にとっても迅速に自分が必要とする情報や書類を得ることのできる非接触情報記録システムを提供することができる。

【図面の簡単な説明】

【図1】この発明に使用する非接触情報記録媒体の概略構成を示す図。

【図2】この発明に係る非接触情報記録媒体の情報を読み書きする機能を含む非接触情報記録端末の構成を示す図。

【図3】非接触情報記録媒体と非接触情報記録端末を用いた全体的なシステムの概念図。

【図4】学生が授業を受ける教室におけるシステムを示す図。

【図5】掲示板などを表示する総合的なRWU端末を示す図。

【図6】RWU端末における処理動作を説明するためのフローチャート。

【図7】RWU端末における処理動作を説明するためのフローチャート。

【図8】人物検知センサの動作を説明するための図。

【図9】ディスプレイに表示されたメイン画面を示す図。

【図10】非接触情報記録媒体の特徴を活かして自動販売機に応用した例を説明するための図。

【図11】事務室前などに設置するRWU端末とその管理者端末との関係を説明するための図。

【図12】RWU端末が非接触情報記録媒体を所持した学生を認識する動作を説明するためのフローチャート。

【図13】非接触情報記録媒体内の期限条件付きデータの処理動作を説明するためのフローチャート。

【図14】期限条件付きデータの処理動作のイメージを示す図。

【図15】時間割管理を説明するためのフローチャート。

【図16】メインの時間割画面における当日の時間割が表示される機構を示す図。

【図17】講義における出欠状態を管理するシステムを示す図。

【図18】管理者が掲示板連絡をするときの通知例を説明するためのフローチャート。

【図19】基本的な証明書発行の動作を説明するためのフローチャート。

【図20】枚数制限がある証明書発行の動作を説明するためのフローチャート。

【図21】有料証明書発行の動作を説明するためのフローチャート。

【図22】管理者端末から出席をとる時の動作を説明するためのフローチャート。

【図23】データ形式を示す図。

【符号の説明】

1…非接触情報記録媒体（学生証）

2…アンテナ

3…変復調回路

4…制御回路

5…メモリ

20…非接触情報記録端末

31a～31e…管理者端末

40a～40f…RWU端末

42、51…RWU端末

43…RWU

44…アンテナ

45…LED

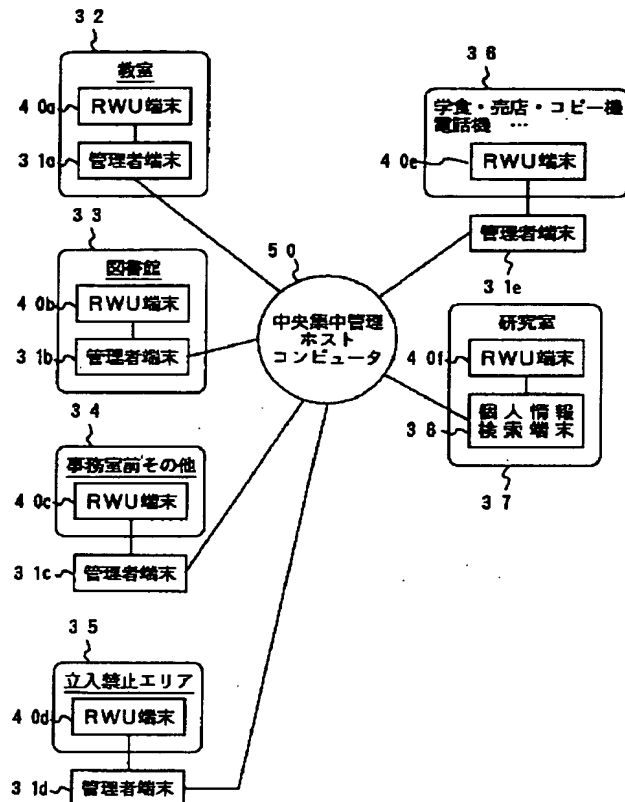
50…中央集中管理ホストコンピュータ

52…RW-ANT（リーダー・ライタアンテナ）

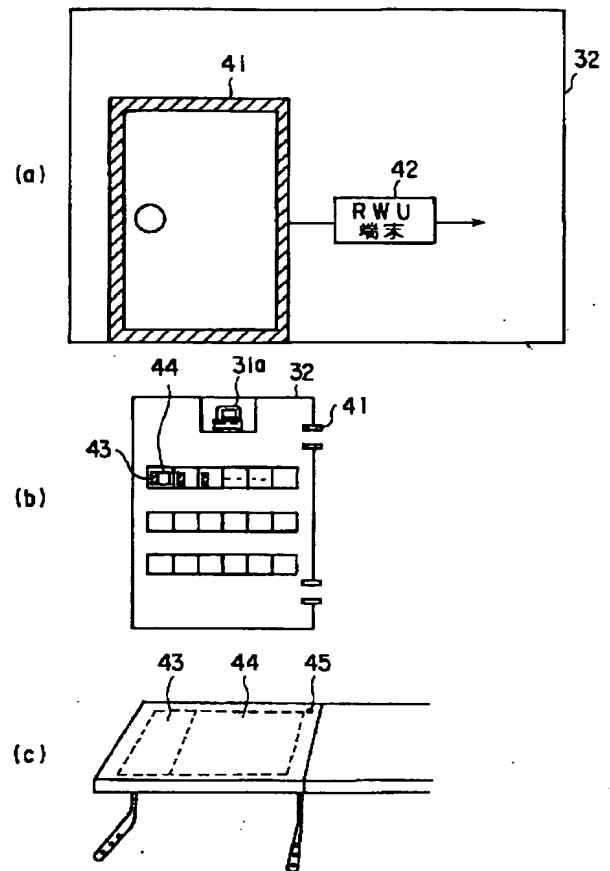
53…ディスプレイ

57…人物検知センサ

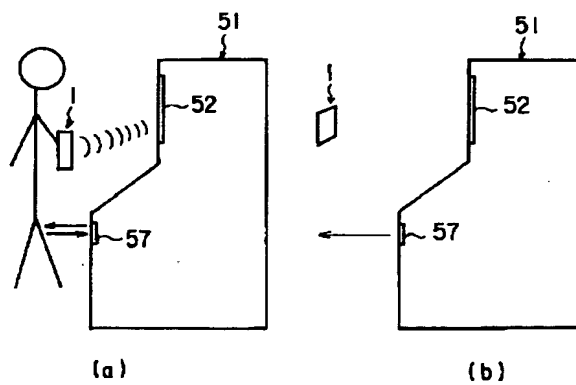
【図 3】



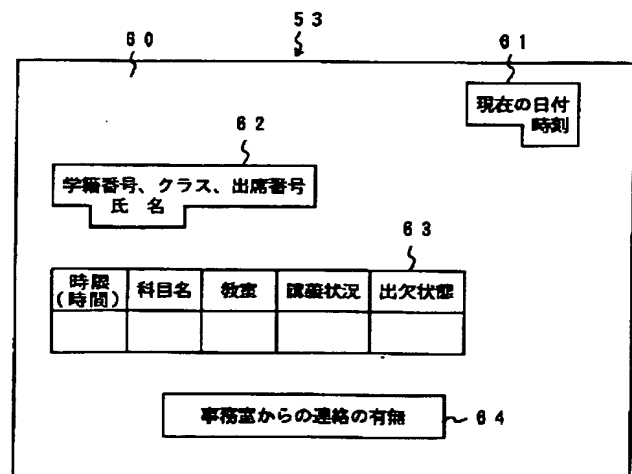
【図 4】



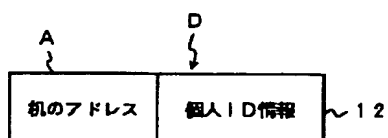
【図 8】



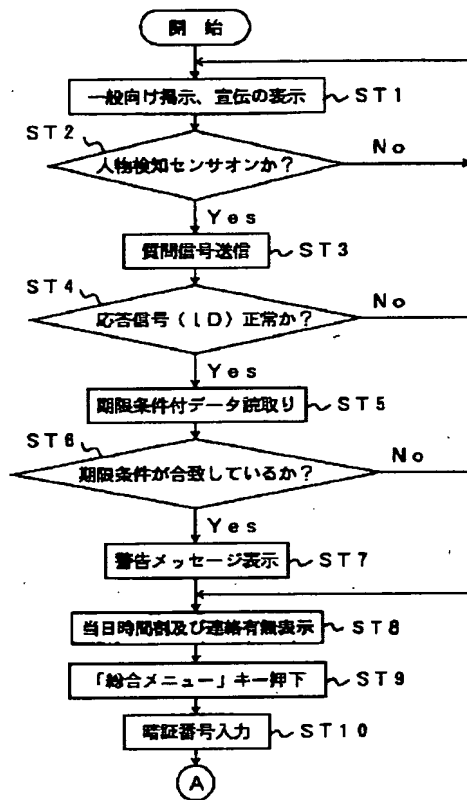
【図 9】



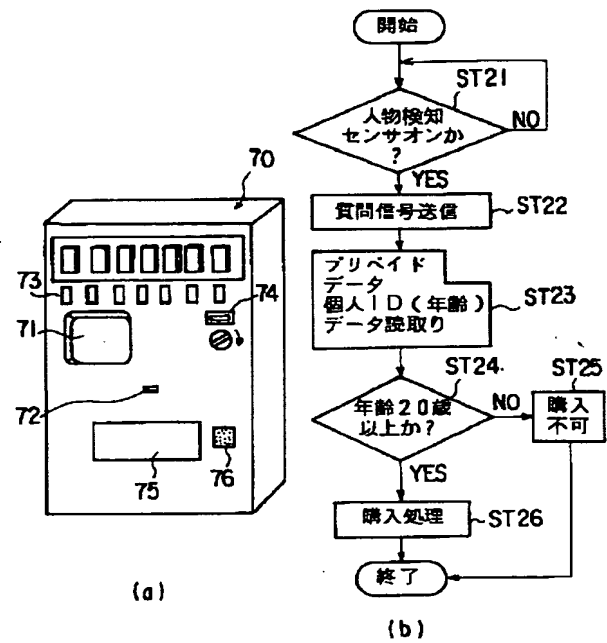
【図 2 3】



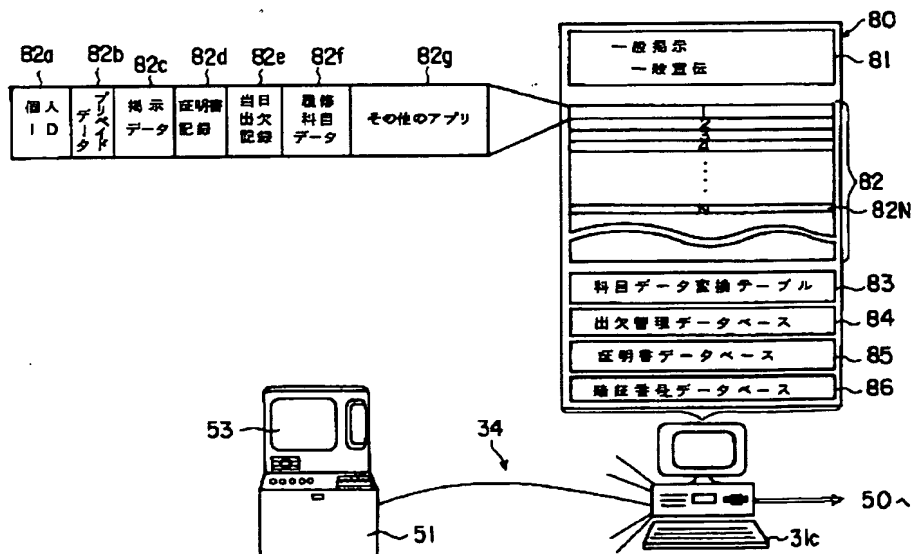
【図6】



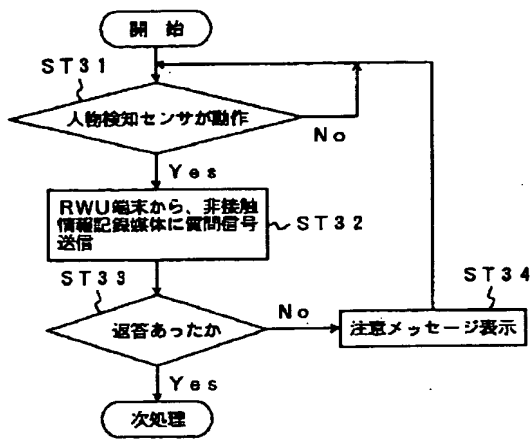
【図10】



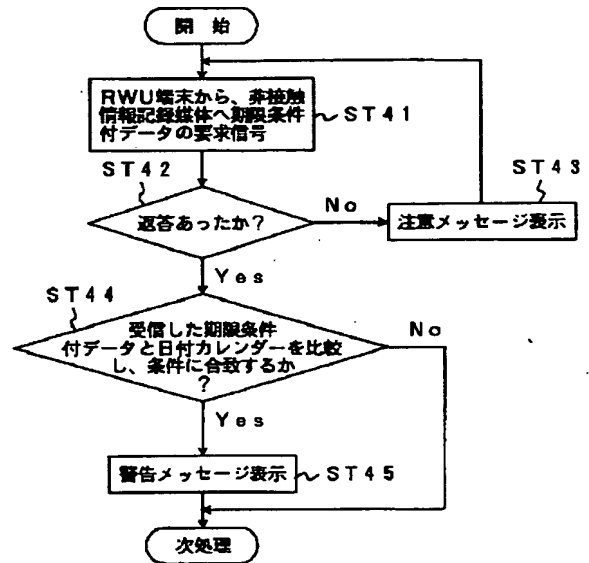
【図11】



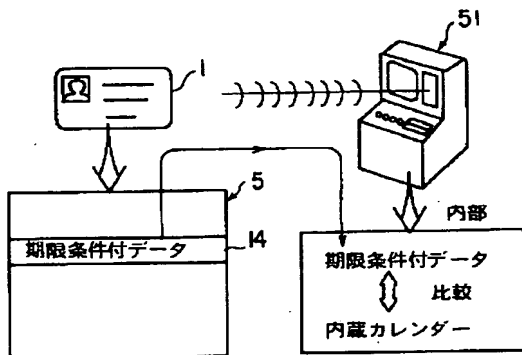
【図12】



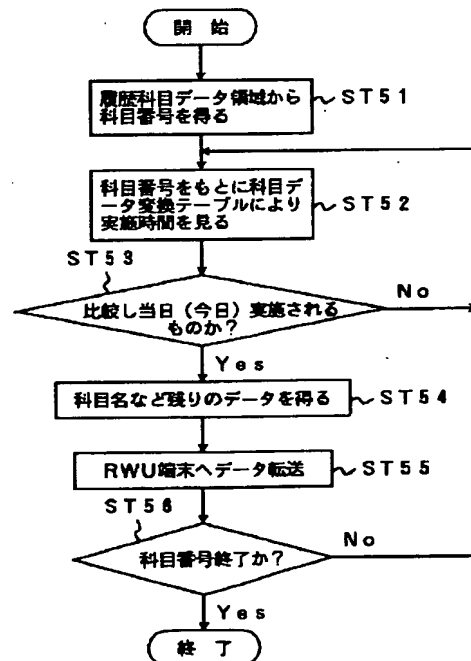
【図13】



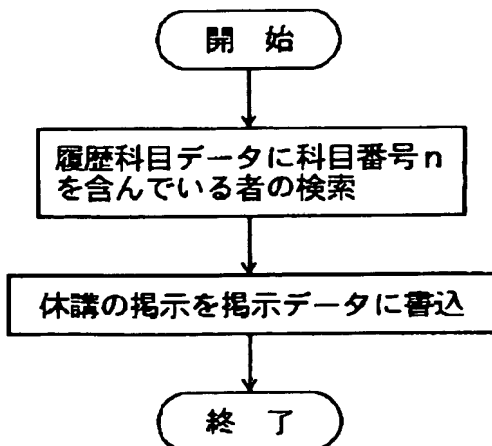
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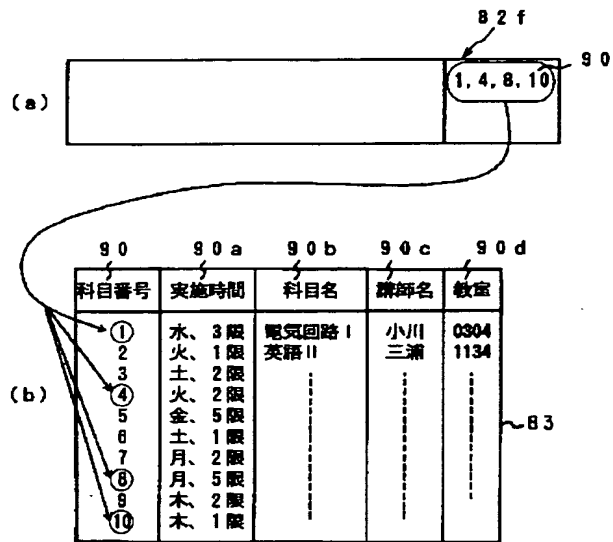
【図15】



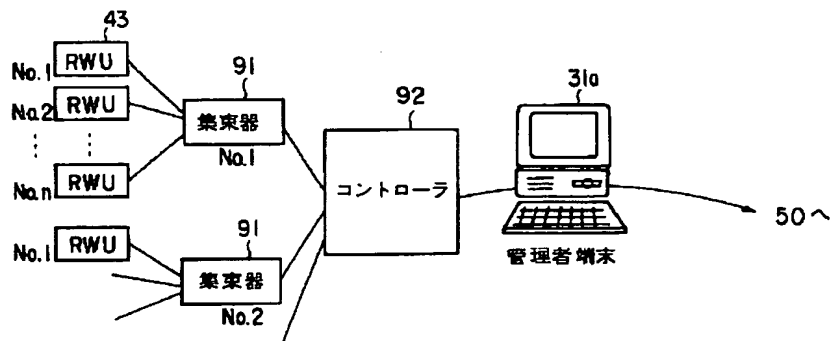
【図18】



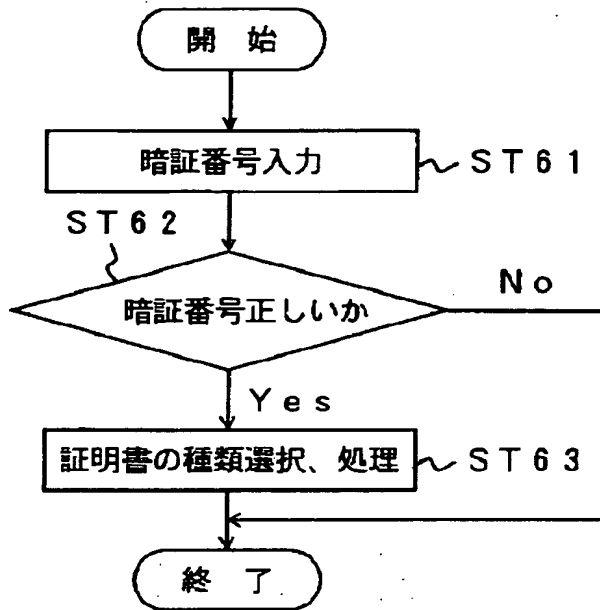
【図16】



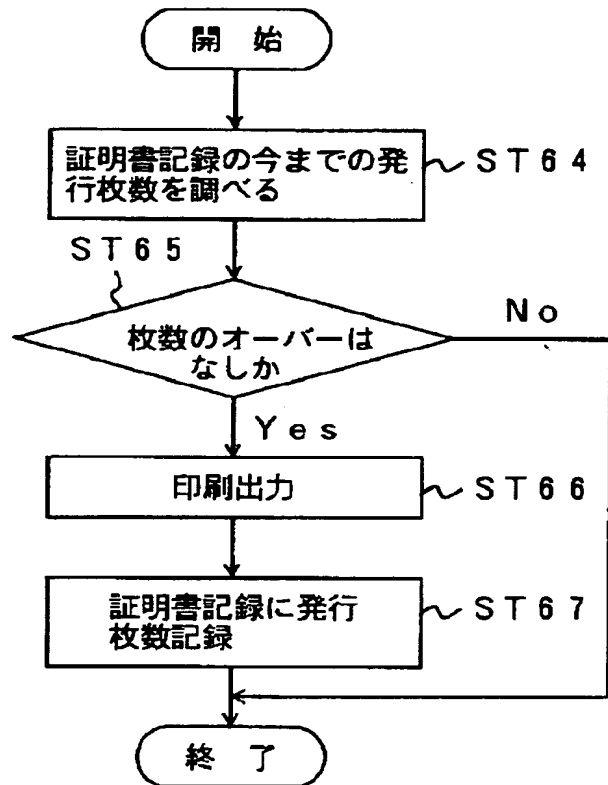
【図17】



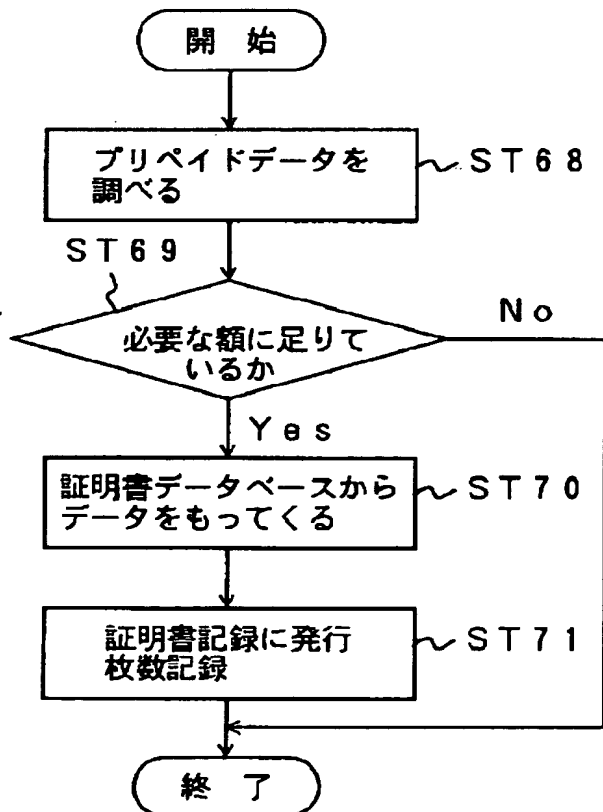
【図19】



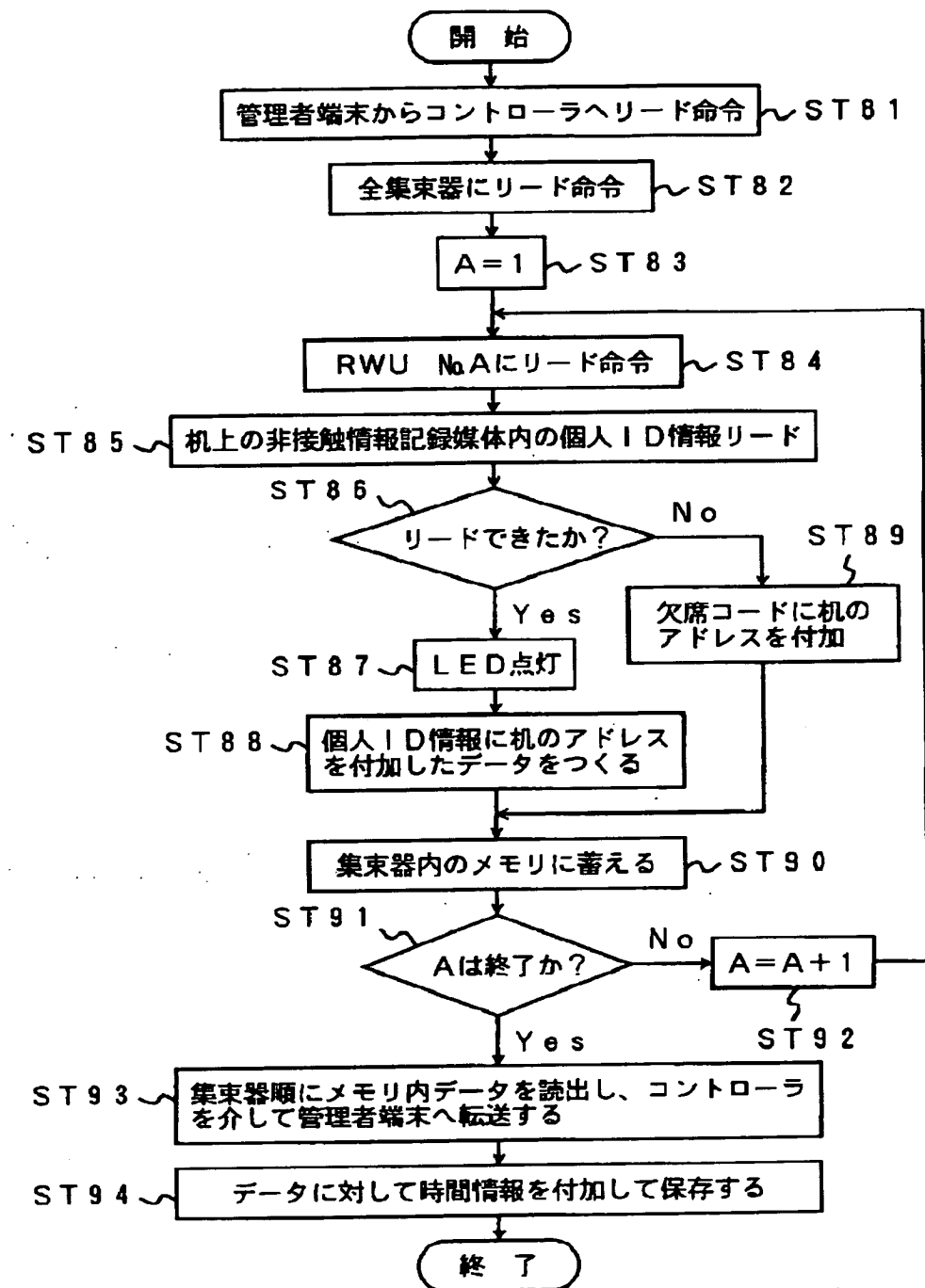
【図20】



【図21】



【図22】



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